COMPUTER FLOORS
Anti-static carpet
Anti-static vinyl
Mats
FITTED COMPUTER CARPET FROM £5 sq. yd.
MARVILLIN CARPET & TILES
Duke St., Bedford. 214155

ComputerWeekly
Thursday, April 9, 1981

BASIC-86
by
MICROSOFT
from
vector
VECTOR International N.V.
Research Park, B-3030 Leuven
Tel.: 32(016)20 24 96 - Tlx.: 26202

Plessey plans autumn CMOS market debut

by Eileen Stainer

PLESSEY will launch this autumn its first range of integrated circuits using the proprietary silicon gate CMOS technology, called ISO-CMOS, which it has licensed from Canadian telecommunications manufacturer Mitel.

The initial range includes an eight-bit microprocessor, the MV68SC02, based on Motorola's 6802 processor, a 16K ROM and a 4K static RAM. Several specialised telecommunication devices will be available immediately, with extensions to the range also coming in the autumn.

Plessey is the last UK company involved in the licensing agreement to announce ISO-CMOS products. GEC and Marconi Electronic Devices (EDL), who were also in on the deal, have already made their announcements.

GEC is concentrating on custom-built chips for telecommunications while MEDL has moved into the semi-custom market with gate array chips.

Samples of some products have already been produced by Plessey Semiconductors at its new CMOS diffusion area in Plymouth, Devon, which is being expanded in September, increasing capacity to 500 slices a week.

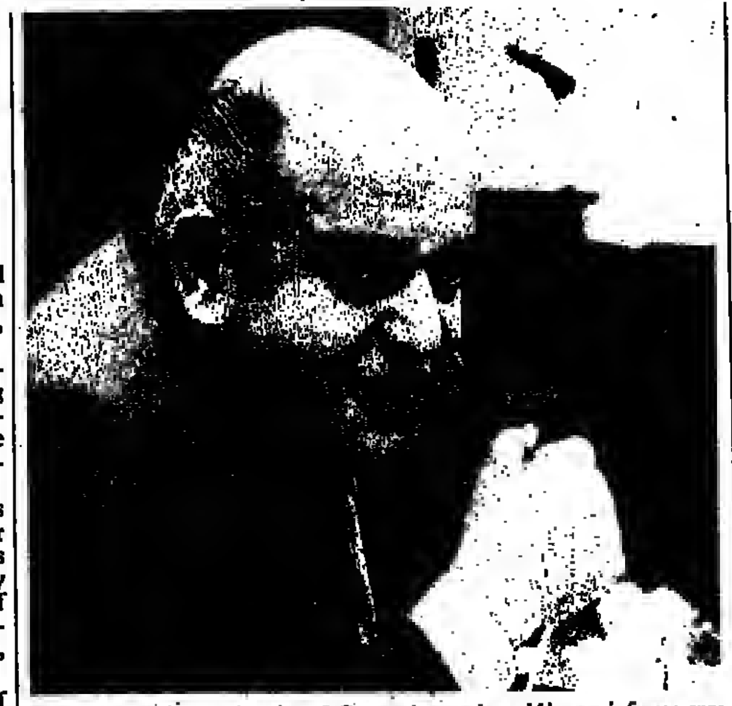
Silicon gate CMOS has been described as the "ultimate" technology for the future, with the low power advantages of CMOS and high speed similar to TTL logic technology.

ISO-CMOS is only one type around now, others are in development. It has one major disadvantage that the newer types should be able to overcome: ISO-CMOS cannot be easily scaled down to the less than two micron dimension which will be feasible, and full of potential, in the future.

The most advanced type available today, ISO-CMOS is being used currently at five micron dimensions but four and three micron developments are under way.

Plessey sees telecommunications and data processing as the major contemporary markets for this type of technology. The company hopes to introduce a family of ULA's (uncommitted logic arrays), in the semi-custom field, starting early next year.

● Plessey Communications of Beeston (Nottingham) has just announced that it will eliminate 425 jobs because of government cutbacks affecting British Telecom orders.



JACK TRAMIEL, founder of Commodore, whose Micromainframe was launched at Hanover.

'Size of a micro, with mainframe operation'

by Eileen Stainer and Rory Johnston

COMMODORE International launched its Micromainframe Computer at the Hanover Fair last week. The dual processor system, one of the fruits of the company's Innovation Projects Program, is claimed to be the size of a microcomputer with the operation of a mainframe.

The company also launched the colour version of the 8032 SuperPet and the 64K RAM 8096 version.

The Micromainframe MMF 9000 runs both the 6502 eight-bit microprocessor from MOS Technology and the 6809 from Motorola. Full compatibility is maintained with Pet software and peripherals, but the system can also operate mainframe languages like Fortran, APL, Business Basic, Pascal and Assembler.

Although the system still looks like a Pet it is a lot more powerful, with 96K of RAM, 96K of virtual memory and 36K of ROM. It was designed with the help of Canada's Waterloo University as a comfortable move for users into large scale computing.

However, its main use is seen as a development system for mainframe computers. Users can develop software on the machine and then transfer it to a mainframe if more resources are needed.

Also demonstrated at the Fair was the VIC-20 personal computer which features enhanced colour graphics and should be available in the UK soon for under £200. Two peripherals for the VIC were on show, the printer and the floppy.

Commodore founder Jack Tramiel disclosed that a hand-held computer of a similar size to a pocket dictating machine would be launched at the next Hanover Fair.

Commodore's MMF9000 looks like a Pet.

IBM UK profits decline

by Keith Jones

IBM UK has reported 1980 financial results showing that not even the industry giant is immune from the parlous state of the UK economy.

At £91 million, net profits were 9 per cent down on 1979 while turnover grew by a sluggish 8 per cent to £954 million, a poorer growth rate than ICL's in its year ended September 30.

In another move, IBM has listed its reasons for applying to the European Court of Justice in Luxembourg for an annulment of legal action against the company by the EEC.

This action reached the stage of publishing a Statement of Objections at the end of last year.

IBM has also described as "rubbish" reports that it has completely frozen all UK capital expenditure as a result of its financial position here.

The company admitted that it had introduced an "expense control programme" which would be "very wide-ranging" and involve cutbacks where "appropriate and proper".

An IBM spokesman refused to provide details of controls being imposed.

He added that the 1981 salary programme for IBM UK employees had been agreed and that percentage increases would depend on individual performance.

IBM wants the EEC Statement of Objections to be annulled on several grounds, claiming that they fail to meet minimum legal standards owing to their incompleteness and vagueness and the "unrealistic deadline" for an IBM response.

MPs agree £200m ICL loan

by Kevin Cahill

AN almost empty House of Commons unanimously agreed on Monday this week to a government motion to give ICL £200 million of loan guarantees.

Kenneth Baker, Minister for Information Technology, refused to make public the terms on which the guarantees had been made, but said the government has laid down four principles:

● The government will closely monitor ICL's performance;
● it will keep in close touch with ICL as it proceeds with its review of long-term opportunities;
● it will expect ICL to consult over major management changes;
● and it will expect to be informed of any forms of co-operation entered into by ICL with any other companies.

ICL chairman Philip Chappell was in the public gallery during the debate and heard opposition spokesman John Garrett (Norwich South) question the optimism of the board last year, and insist that the company needed new outside directors. Garrett asked Baker whether the government would permit the sale of ICL to a foreign company, specifically NCR or Sperry Univac.

Hugh Dykes (Conservative, Harrow East) noted that the company had been taken by surprise by the pace of events last year. He expected it to make an authoritative statement on its plans at the earliest possible moment.

In a bitter attack, Gwyneth Dunwoody, Labour MP for Crewe, whose constituency includes many Winsford workers, said that ICL had "betrayed" those Labour MPs who were asked for and gave their support to ICL's bid for the PAYE contract.

Closing the debate, Kenneth Baker said that ICL was not the British computer industry, which consisted of many companies — medium and small — and that the guarantees will be seen as government backing for a strategic sector.

He repeated that it was up to ICL to decide how to secure its own future, but the government would want continuity and assurances in relation to its enormous customer base — which he set at over £2 billion.

The government was looking to a range of proposals to enable it to double its R&D assistance to ICL from the current £6 million for a variety of projects, he said.

The lowest prices in Britain?
Check our prices for
LA34 VT100
LA120 TALLY 1612
HAZELTINE VDU's
● OFF THE SHELF DELIVERY
● NATIONWIDE SERVICE
MCS

Acorn

● From front page

deadlines on hardware and software. Having sold some 7,000 Atoms, it plans to produce by the end of the year some 12,000 micros, to cope with the expected demand from viewers of the BBC television course, with a further 12,000 by next March.

Doubts have been raised, particularly among others who have ... for the lucrative ...

Meanwhile, the BBC and Acorn are putting the finishing touches to a ... of the Basic interpreter, which will be very close to Microsoft's.

COMPUTER FINANCING INTERNATIONAL LIMITED
SALE 370/158 MP4 SYSTEM LEASE

High performance editing graphics terminal for around £1250
DATA TYPE

CIFER 2680 Series
Intelligent and User Programmable Video Terminals
● Totally British Design and manufacture
● Available in Volume NOW
OEM Sales and Support Offices
South West—Melksham 0225 704502
South East —London 01-580 3365
North —Nottingham 0602 70441

ComputerWeekly
Thursday, April 23, 1981 Number 754 25p

DATA PREPARATION
We have the capacity to punch your peak loads, file set-ups or regular work on 80 column cards.
Peter Merrick ASSOCIATES
'Phone 01-688 6047 Croydon

Joint council spec opens up huge market

by David Craver

HUGE sales are in prospect for standard systems being developed for local government direct works departments in a project involving 155 local authorities.

The project, undertaken by the Chartered Institute of Public Finance and Accountancy (Cipfa), has so far resulted in a functional specification from which programs can be written for mini and mainframe computers.

A complete management and accounting system has been designed for local authority treasurers, engineers, surveyors, and works and housing managers in direct works organisations. Direct works is the umbrella name given to jobs carried out by council employees rather than private companies. It centres on road and housing maintenance and construction.

The system specifications represent "a challenge to computer manufacturers to come up with a solution", according to John Scotford, Deputy-County Treasurer of Hampshire and chairman of the Cipfa Standard System Steering Committee.

ICL, IBM, Honeywell, Univac, CMC, NCR, Nixdorf and DEC have been approached by Cipfa to determine what they can offer in the way of a package deal. The system envisaged by Cipfa would be on a standalone mini or incorporated onto existing mainframes in the case of larger authorities.

Cipfa hopes that some kind of preferential or quantity discount can be arranged, and while it does not intend to recommend a particular supplier, it does plan to give its stamp of approval to acceptable standalone mini systems.

The functional specifications, which were drawn up under contract by Logica, run to some 1,400 pages. They took the equivalent of 4½ man-years to write, and cost about £500,000. The specifications are designed to allow authorities, either on their own or in a consortium, to select elements appropriate to their own needs before undertaking the final programming stage.

A Logica spokesman said it would "obviously be very interested" in continuing its involvement in the project, although its initial contract is at an end.

Estimates of the cost to an authority to implement the system are necessarily nebulous at this point, but Logica thinks that a minicomputer approach might run from £40,000 to £90,000 for hardware. Software development could be anywhere from £40,000 to £400,000, with the cost to the individual local authorities dependent on the kind of package deals that can be arranged, and whether authorities choose to go it alone or form groupings of authorities with similar requirements.

READ . . . "We're selling more than ever, despite price reductions."

Univac targets mainframe sales

SELLING mainframes at "£1 million per shot" will be the major thrust of Sperry Univac's marketing effort in the UK this financial year.

Managing director Bill Read said last week that he "didn't believe" in the worldwide drop in sales of large systems which has been claimed by Information minister Kenneth Baker among others.

Presenting the company's performance at an end-of-year review, Read said that Univac's 1100 mainframe series accounted for 62½ per cent of UK revenues in the year ended March 31, and he expected it to bring in 50-60 per cent during the current year.

"We're selling more than ever . . . despite the ghastly reduction in price of memory and disc systems," he quipped. By contrast minicomputer sales from Univac's V77 range accounted for 10 per cent of revenues last year.

Read said he expected a "significant increase" this year for the former Varian machines, though he made the same prediction at his review last year when mini sales were also 10 per cent of revenues.

Noting that Univac has yet to announce a 32-bit minicomputer, Read said: "I wouldn't be surprised if something happened in the next 12 months."

Worldwide revenues for Univac to March 31 are expected to be 17 per cent up on last year at $2.7 billion, said Read, with bookings (orders) up 15 per cent to $2.5 billion. The UK division now accounts for 20 per cent of the bookings of the dollar denominated international division and is the largest foreign subsidiary.

● Univac launches Mapper in UK, see page 4. Performance Measurement Service, see Software File, page 8.

Software first in Queen's Awards

by Paul Fisher

SOFTWARE has for the first time been recognised in the annual Queen's Awards for Exports and Technology. Micro Focus has won a technology award for developing CIS Cobol, and BIS software has an export award for selling its Midas banking package into 37 countries.

Just three years ago the Computer Services Association was decrying what amounted to a Queen's Award software ban on the grounds that it was not "high technology".

Micro Focus is in among the honours because two of its American salesmen, Paul Adams and Paul O'Grady, have received Super Software Seller awards for selling over $1 million worth of CIS Cobol products in 1980.

BIS Software has sold £9 million worth of its Midas banking systems since 1976 and the company's exports have increased from £366,000 in 1978 to £1,559,000 in the year ending June 1980. Chairman Roger Graham comments "we've increased our exports to 63% of turnover".

Prosser. "We're very proud."

Apple blames faults on growth

by Eileen Stainer

FAULTS with initial batches of Apple IIIs and the year-long wait for the product have been put down to the high growth rate of the company by Tom Lawrence, head of European operations for Apple.

First deliveries of the company's new business system arrived at US users with missing chips, because loose sockets caused them to fall out during shipment, and with cable problems, mechanical faults in connectors and a faulty clock/calendar chip from National Semiconductor.

Apple has now reimbursed each user with $50, and has stopped using the chip.

"It was unfortunate that the faults were not detected until the user. They should have been detected by us before," Lawrence said. He put the failure down to the strain within the company during its high growth period.

The faults have all been corrected now and shipments are up to 1,000 units per month, said Lawrence.

The Apple III is not yet available in the UK but units have gone to dealers for initial development and training.

NEWS BRIEF

Mostek move to Motorola

MOSTEK, the semiconductor manufacturing subsidiary of United Technologies, has made a significant move from second sourcing members of Intel's microprocessor family to second sourcing Motorola's 68000 family. The agreement is the second the company has announced in the past month. The first was with Signetics and Philips, which also signed to second source the 68000 family.

City study

A WORKING party has been set up by a group of City of London institutions, under the aegis of the Bank of England, to look into the long-term policy and needs of the financial community regarding information technology. Chaired by Timothy Bevan of Barclays Bank, the group will be primarily concerned with the provision of telecommunications services but it is expected also to look at broader issues.

French-US deal

THOMSON-CSF from Paris and Continental Telephone from Atlanta have formed a $400 million joint business communications equipment venture. Included in the deal is Continental subsidiary Executone which markets digital phone equipment throughout the States.

DEC versions

DIGITAL Equipment has strengthened its position in the structural engineering sector with two major software acquisitions. For DEC's 32-bit VAX machines there is now a version of Gtstrudl, the Georgia Tech Structural Design Language, while VAX and also PDP-11 users can now run the Genesys library of 40 applications programs.

INSIDE THIS WEEK'S ISSUE

... in UK next year	2
... computer shrinks Cobol software	4
... standards needed	5
... speech synthesis	6
... active life of software	8
... moves back into profit	9
EEC to fund Ada growth	2
Money back from IBM info firm	3
UK can lead in teletext	4
French unions paralyse research	5
Micro News	6
Software File	8
Company News	9
Gill's Mythodology	10
Leader	11
Letters to the Editor	11
Op Spot	12
Programmers Page	13
Data Analysis	14
People	15
Parallel systems	16
Robots and competition	17
Products	18/19
Books	22
Sales Bit	39
'End monopoly' call	40
JOBS	23/39

Storage Technology Ltd.
Announce another record 1st Quarter
Revenues up by 26%
Orders up by 60%
Storage Technology the World's Leading Supplier of Plug Compatible Tapes, Discs, Memory and Printers are proud to announce another record 1st quarter in the U.K.
New U.K. Headquarters
Chertsey House Portsmouth Road Esher Surrey. Tel: 0372 67041
Fulfilling the promise of technology

Teletex available in UK 'early next year'

by Rory Johnston

TELETEX, the scheme to combine the capabilities of word processors and telex to provide high quality electronic mail for businesses, is to be launched in the UK early in 1982, British Telecom has announced.

The special terminals required will be supplied by private industry, according to BT's plan, and communications will be both by the public telephone network and the yet-to-be-launched Packet Switched Service.

An international standard has been more or less agreed by the CCITT, under pressure from the Germans and Swedes who have been pressing ahead with their own developments.

Siemens and Philips have both produced special-purpose terminals, and Philips has also produced an adapter for its word processors.

BT intends to provide a means of communicating with Teletex terminals in other countries, as well as an interface to the telex network for those without Teletex machines.

The aim of Teletex is to provide quality document transmission including upper and lower case and other word processing facilities, along with a store-and-forward function, eliminating the major problem with telex that arises when the receiving terminal is engaged.

The storing and forwarding is done not by the network, but by the transmitting terminal, which is capable of dialling the destination via the ordinary telephone network and trying again if engaged.

The receiving is also entirely automatic; several incoming documents can be held in store until required for reading or printing out. The terminal could be a simple hard-copy unit or, like that produced by Siemens, it could include a screen with a range of editing facilities.

BT's managing director Peter Benton described Teletex as "a major step forward in office automation." Several UK firms have been discussing the possibility of supplying terminals with BT.

They will have a considerable amount of development work to do to get products ready for the marketplace. BT is looking around for any other firms that might be interested.

Transmission speed will be up to 3,500 words a minute, as opposed to telex, which runs at 80 words a minute.

BENTON: Teletex is a major step forward

EEC to fund Ada growth

THE Commission of the EEC has approved two contracts for the development of software for the Ada computer language under the Community four-year data processing programme.

A grant of 50% up to a maximum of £2m is to be given to a French/German consortium consisting of CII-Honeywell Bull, Alsys and Siemens, while a Danish/Italian consortium will receive a 50% grant of about £1.5m.

The consortium comprises Olivetti, Ch. Rovsing and the Danish Datamatics Centre. UK company System Designers was an important sub-contractor in the Danish/Italian project.

Both contracts received the full support of the advisory committee for the management and co-ordination of the programme.

"The decision to support developments for the Ada computer language was reached because Ada supports very closely the requirements for a European systems language, identified in a previous study conducted for the Community," said the statement.

"Ada, which is the result of an American-sponsored international effort with an important European contribution, is a high-level general purpose computer language. Although the language was initially intended mainly for computer systems typical in military applications, the resulting language, as it is now defined after an extensive and open scientific debate, is applicable in wide areas of industry and science.

"Although the international competitive development was sponsored by the US Department of Defence, it was the European-led team headed by the firm CII-Honeywell Bull with experts from many Community member states which won the competition."

Union action puts pressure on public

by Nicholas Enticknap

TACTICS have changed this week in the industrial action being mounted by both the Civil Service unions and the Banking Insurance and Finance Union BIFU. The emphasis has switched from pressurising employers by shutting down computer installations, to pressurising the public at large.

The Civil Service unions, now in their seventh week of industrial action, are still maintaining their strikes at government computer centres, principally those at Cumbernauld, Shipley and Southend.

The failure of this action to produce any response from the government has, however, led the unions to increase pressure by taking action which will directly affect the general public. As a first step, plans were announced to disrupt airports and ports over the Easter holiday period.

BIFU has given the go-ahead for a second phase of industrial action, to start this week. It will involve 24 hour strikes, followed by a work-to-rule and an overtime ban at bank branches in selected parts of the country.

The Joint Credit Card Company, which runs the Access card scheme, will be involved this time, along with the major clearing banks.

The company will be affected by a series of 24-hour stoppages in key departments, including the computer centre.

Half price bid to cut all costs

by David Craver

A HALF-PRICE sale of Mathematica's Product Group's database management system Ramis II "could result in lower price software for everyone", according to Frank Fish, vice-president of marketing, who announced the three-month special offer last week.

Fish expects MPG's aggressive approach to put pressure on other software companies. The move, which only applies to the UK market, is part of a decision to make the London office the "launching pad for expansion into Europe".

The object of the offer is to double the company's user base, and is possible because of record half-year results. Ramis II, which combines a database management system with a non-procedural language for report preparation and files maintenance, is compatible with all major IBM operating environments, says the company.

Fish estimates that MPG has a 15% share of the database management market on IBM installed equipment in the UK, with IBM's own software accounting for most of the rest.

The half price sale, which ends June 30, will make Ramis II available from between £6,500-£38,000 depending on the options chosen. An average system based on full pricing usually sells for around £30,000.

FISH: cheap software for all

Wilkes Computing
for Terminals
DEC®
LA34 VT100
LA120 LA180
Anadex Ltd.
DP9000 DP9500
DP9001 DP9501
LOW COST 200 cps
BI-DIRECTIONAL PRINTERS
VISUAL 200
* LOW COST
* HIGH PERFORMANCE
DETACHABLE KEYBOARD
SWITCHABLE EMULATIONS
SMOOTH SCROLL
Diablo
DAISYWHEEL HIGH QUALITY PRINTERS
630 1640 1650
TEXAS INSTRUMENTS
TI810 TI825 TI765
TI820 TI745 TI743
Wilkes Computing
Tel (0272) 25921 Telex 449205

Adler buys Omnidata

by Rory Johnston

OMNIDATA, the California-based supplier of combined word and data processing systems, has been bought outright by Triumph Adler, less than two years after the German firm took a minority share with an option for buying the remainder.

Paul van Alstyne, founder and main shareholder in Omnidata, has been appointed to oversee all word processing within Triumph Adler, which also owns Royal Business Machines and Pertec in the US.

TA's option to buy was brought forward following good progress in product development at Omnidata; the sum involved is not disclosed. What will happen to Omnidata's product, the Omni 2, within the US is also not yet clear.

At present, it is not sold there because Royal is concentrating on the German-made Bitsy.

Triumph Adler, which is itself owned by Volkswagen, has undergone a substantial reorganisation, with the president of Royal, Robert Hagy, being established as van Alstyne's immediate superior.

Inmos names agents

by Eileen Stainer

DISTRIBUTORS for the Inmos IMS 1400 16K static RAM in the UK will be Rapid Recall and Hawke Cramer, the semiconductor company has revealed.

The IMS 1400 is currently being manufactured at the company's US facility in Colorado Springs. Production at the South Wales plant, which is still under construction in Newport, is expected to begin by the middle of next year.

Further products expected from Inmos later this year are a 64K dynamic RAM, the IMS2600, and another 16K static RAM, the IMS1420, which has a 4 by 4K bit format as opposed to the 16K by 1 bit of the 1400.

The 2600 is said to have redundancy in its design and have an access time of 100 nanoseconds.

In Europe, Inmos is setting up sales locations with managers in Paris and southern Germany. Tekelec has been appointed distributor in France, while other distributorships are under negotiation for the rest of Europe.

ComputerWeekly
Thursday April 23, 1981
Vol 30 No 754
100,000 circulation – the highest of any computer journal in Britain
IPC Electrical-Electronic Press Ltd, Quadrant House, The Quadrant, Sutton, Surrey SM2 5AS. Telex: 892084 BISPRS G

EDITORIAL
Enquiries: 01-661 3500 ext 3542/3541
Editor: Simon Timm 01-661 3122
Deputy Editor: Brandon Gamester 01-661 3124
Associate Editors: Keith Jones 01-661 3040; Rory Johnston 01-661 3042; Kevin Cahill 01-661 3041
Software Editor: Claire Gooding 01-661 3043
Micro Editor: Eileen Stainer 01-661 3044
Reporters: Donald Kennett 01-661 3049; Paul Fisher 01-661 3052; David Craver 01-661 3050
Chief Sub-editor: Mike Marples 01-661 3053
Deputy Chief Sub-editor: Nancy Pocock 01-661 3500 x3548
Subeditors: John Bull 01-661 3500 x3541; Julie Cotterill 01-661 3500 x3544

DISPLAY ADVERTISING
Advertisement Manager: Harry Hutson 01-661 3101/3102
Deputy Advertisement Manager: Chris O'Hea 01-661 3125
Sales Executives: Ian Carter 01-661 3500 x3572; Steve Bass 01-661 3500 x3570; David Hogan 01-661 3500 x3539; Xenia White 01-661 3500 x3571
Manchester: Harry Aikin 061-872 8861
Birmingham: Ken Parrott 021-356 4838
ADVERTISING PRODUCTION
Display: Roger Albury 01-661 3500 x3574
Classified: Steve Lever 01-661 3104; Martin Lawrence 01-661 3500 x3576

CLASSIFIED ADVERTISING
Advertisement Manager: Brian Durrant 01-661 3106
Assistant Advertisement Manager: Chris Prier 01-661 0121
Supervisor: Neil McDonnell 01-661 0121
Consultancy Sales Advisers: Ian Faux 01-661 0121; Julia Hannaford 01-661 0121
Sales Executives: Denise Smith 01-661 0121; Kevin McOwan 01-661 0121; Gillian Johnson 01-661 0121; Peter Regis 01-661 0121
Manchester: Owen Kelly 061-872 8861
Birmingham: Viv Sherat 021-356 4838

CIRCULATION
Terms of circulation control: Computer Weekly is sent free of charge to the following categories in the UK and Eire only: Company directors, company secretaries, management service executives, civil servants responsible for computing, management/computer consultants, lecturers and teachers, DP manager/supervisor, systems analysts/O&M officers, programmers, operators, computer salesman and field engineers.
Subscriptions: UK £18, Students £9; US, Canada $78, Students $39; Europe £30, Students £15; Middle East, North Africa (airmail) £47; North & South America, Southern Africa, South Asia (airmail) £52; Far East, Australia & New Zealand (airmail) £56.
Circulation Dept: IPC Business Press (S&D) Ltd, Oakfield House, Perrymount Road, Haywards Heath, Sussex. Tel: 0444 59188.

BRANCH OFFICES
Birmingham: Union House, 202 Walsall Road, Birmingham B42 1BA. 021-356 4838
Manchester: Grove House, Skerton Road, Old Trafford, Manchester M16 0WL. 061-872 8861
New York: 205 East 42nd Street, New York, NY 10017. (0101-212) 867-2080

Publishing Director: Dr J A G Thomas. Editorial Director: Chris Hipwell.
Published weekly on Thursday. Registered at the Post Office as a newspaper. ISSN 0010-4787 © IPC Business Press Ltd 1981.

Money-back offer by IBM-info firm

by Keith Jones

THE IBM-oriented conference company, Xephon, has announced an unconditional money-back guarantee on all its consultancy briefings for IBM users. Founded last year by ex-Infotech staff, Maidenhead based Xephon has already experimented with conditional guarantees dependent on the delegate not benefiting from the briefing in the medium to long term.

But with the unconditional guarantee Xephon is turning the "information transaction" on its head, according to Xephon director, Chris Bunyan. He points out that the value of information, unlike other commodities, can only be assessed after it is received by the customer, at which point he cannot give it back. Under the Xephon guarantee the customer receives the information at the briefing and then decides if it is worth the price before allowing Xephon to keep his attendance fee.

Asked if Xephon might be "wiped out" by a disastrous conference after which all the delegates united to demand their money back, Bunyan said that a disaster was highly unlikely. Even if it happened the effect on Xephon would not be devastating, because the company was concentrating on staging a lot of relatively small briefing events rather than a few major conferences. Most briefings would be attended by no more than 40 delegates.

Bunyan also pointed out that Xephon would need to refund fees to any customer who demanded it even without the guarantee in order to keep his custom. Xephon's pool of potential customers was relatively small, being confined to between 600 and 700 IBM data processing division sites in the UK.

Bunyon added, "I do not imagine that there will be many 'rogue' customers who will invoke the guarantee unfairly and we will simply stop doing business with individuals or organisations that do."

A spokesman for the much bigger and long established conference company Online, which offers no money back guarantees, said that delegates very rarely asked for their fee to be returned. There were a few cases of foreign delegates complaining that they had misunderstood the purpose of a conference and they were usually invited by Online to attend a more appropriate future event free of charge.

Prime innovates with 850 hardware

by Keith Jones

PRIME has launched a vehicle for its Primos time-sharing operating system that takes the company into the performance sector addressed by the top end of the IBM 4300 line. Called the Prime 850, the new 32-bit machine incorporates two instruction execution units, a hardware innovation that takes advantage of the multiple instruction stream handling capabilities of Primos.

Each of the two instruction execution units comes with its own 16K-byte, 80 nanosecond bipolar cache memory and an instruction pre-processor which gathers instructions from the cache, decodes them and resolves effective addresses. The whole set-up is called an Instruction Stream Unit, ISU, and operation of the two complete ISUs is supervised by the Stream Synchronisation Unit. SSU functions include validating information in each cache and ensuring that it is up to date. It also manages messages between the ISUs and synchronises main memory access. The ISUs share the same main memory and the same copy of Primos which has been enhanced to Revision 18, a new version to accommodate the new architecture.

Revision 18 is also available for the smaller Prime Series 50 machines, thus providing total software compatibility for the user upgrading to an 850.

Along with the 850 launch Prime has also drastically upgraded the smaller machines. The 450 and 550 models have been phased out and superseded by "Mod-II" versions of the 150, 250 and 550, offering up to 70% more power than their original versions. The former top end machine, the 750, has also been upgraded so it can now support 50% more terminals.

Confronted with the suggestion that it might be all powered up with nowhere to go, Prime points out that the 850 hardware is complemented by powerful systems software such as Prime's own Codasyl compatible database management system and the Informatics [illegible] transaction processing monitor [illegible].

Service for IBM users

MONTHLY memoranda providing a wide range of information about IBM form part of a new subscription service called Inquiry: IBM, introduced by the Yankee Group. It costs £3,500 a year.

The memoranda will include information such as quarterly assessments of residual values, IBM system and product profiles and analyses and IBM user reaction to new products. Subscribers will also receive several major reports.

Information about Inquiry: IBM is available from Al Dunn or Gwendolyn Thomson, at the Yankee Group, Regal House, Lower Road, Chorleywood, Herts, WD3 5AP. Tel: Chorleywood (09278) 4714.

LOUTH . . . failures will remain transparent to the user.

Barclays offshoot to upgrade with Tandem

AMONG the first customers for an expanded transaction processing system announced worldwide by US company Tandem Computers last week will be Mercantile Credit, the finance house subsidiary of Barclays Bank.

Barclays and Mercantile are current users of NonStop, the multiple processor system which ensures a very high degree of user availability by duplicating processors, input/output facilities, memory and peripherals. Mercantile is likely to move to NonStop II, as the bigger system is called, to support over 200 interactive terminals.

Tandem, which is five years old and claims to be the fastest growing publicly quoted computer company in the US, says the NonStop II system is expandable up to 16 processors addressing a maximum 16,000 megabytes of virtual memory.

A 32-bit data access architecture, and a separate processor to monitor the system and advise on failures have been introduced. But UK managing director John Louth emphasises that, as with the original NonStop, failures are transparent to the user because double the absolute minimum processor capacity acceptable is always supplied.

Processors are independent, with their own I/O channels, power supplies and memory. Data is read from one but written on to two disc systems, for example, so that each mirrors the other. "Spare" processor capacity is typically taken up with interruptable applications, while printers and other peripherals are duplicated.

According to regional customer engineering manager Noel Johnston, a theoretical analysis has shown system failure is likely to occur once every 56 years.

Applications flexibility for the future is provided by a loadable control store for adding instructions to microcode as part of normal software update and with "minimal" interruption, says Tandem, and the system is compatible with the original NonStop.

Speaking at the company's California head office, vice-president David Mackie said: "This means that our users . . . will be able to retain virtually all their original investment in software and most hardware if they choose to upgrade to the NonStop II."

Turnover for the whole company rose to $108 million last year, an increase of almost 100% on the year before. Louth expects revenue to double again this year.

Burroughs-China talks

by Kevin Cahill

BURROUGHS is expected to announce a significant order for Chinese sourced components later this month, according to Herb Hayde, a senior manager in the company's Pacific/Canada Division.

Herb Hayde visited China in February with Bill Conlin, vice-president and group executive of Burroughs International group.

The executives were in the People's Republic of China in advance of Burroughs chairman Michael Blumenthal, who will visit Peking at the end of April.

'Compiler compiler' shrinks Cobol software down to micro size

by Claire Gooding

USERS who wish to "shrink" existing software applications so that the same programs will run on a micro could be aided be a new package from Angusglow.

The latest version of its Alpha-Cobol "compiler compiler", Level 3.3, is now being used to recompile existing software from larger minicomputers so that it can be run on different target micros.

Alpha-Cobol entered late in the fight for the market in micro versions of Cobol, but the marketing strategy has been careful and the developers have up to now concentrated on user facilities for software development rather than portability.

"We're only just realising the potential of its data-driven structure," said Alpha-Cobol's marketing manager Leo Scheiner. "Somebody approached us the other day wanting to rewrite an entire suite of 60 programs on a Hewlett Packard 3000 to run on micros. We've discovered that using the new release, it becomes effectively a small editing job, not a major rewrite."

Alpha-Cobol has a level above the compiler which allows it to be re-configured: the compiler compiler. It is this "data driven" facility which makes it possible to make Cobol compilers to order. Angusglow calls the compilers PC Cobol, because of what it calls their software "plug compatibility".

The metalanguage source for the Cobol compiler compiler is made to emulate the original machine's version of Cobol, and the compiler it then recompiled, a task which takes a matter of minutes. The source code is then run through the compiler, to produce a compact version of the package which can run on any micro.

Any peculiarities caused by specific OS/Cobol interfaces can be dealt with by making minor logic changes to the source code. This, says Schelner, is at the most o two to three man-day job.

Alpha-Cobol was launched last year for use with the Alpha Micro System, and Augusglow claims that the product gives genuine real time multi-user compile and run facilities, and can compile up to 400 lines of Cobol per minute.

It is an implementation of ANSI 74 Cobol, with features added in the Level 3.3 release which anticipate the demand for screen handling facilities within Cobol.

"The screen handling facilities are way ahead of anything else I've seen," said Scheiner. "What we've done is to put into the compiler itself many features usually managed by a pre-processor. It seemed like a practical idea to have prompts which matched the variable names in the data division.

"What happens is that the screen section accesses the data division and the names are used as prompts. There are nine screen modes to choose from, and they can be set up with different parameters."

The data-driven structure of Alpha-Cobol was originally chosen for ease of maintenance and reliability, but is now beginning to realise untapped potential as a development and "translation" tool, which enables portability.

BAKER . . . confident — as long as we "strain our guts".

'UK can lead in US teletext market'

by Rory Johnston

THE UK has o good chance of capturing the US market for teletext systems because of our technical lead so long as we "strain our guts there". So said Information Technology Minister Kenneth Baker on his return from the US, where he launched a teletext experiment being run on a Chicago television station by Marsball Field.

About 100 special television receivers are being installed in public places in Chicago and the 200 pages being broadcast will include local news, stock prices, and similar information. The technology is being provided by British Videotex with help from the BBC.

Although several trials of viewdata telephone-link systems are going on in the US, this is thought to be the first broadcast teletext service, and Baker is confident that UK technology will win out in this market.

Teletext is going to be much more important than viewdata for consumers in the US, Baker thinks, because there is no standard-making body for telephone systems comparable to the Federal Communications Commission in broadcasting.

Viewdata will be used in the US more by business, as it is at present in the UK, Baker adds. The potential for teletext via cable or subscription television in the US is very large, he feels, after conversations with the chairman of the FCC, but many US commercial organisations are not yet clear how to use it. Consumers would be prepared to pay an extra $5 to $10 a month for teletext, a survey has shown.

Baker also visited Inmos in Colorado Springs.

SALES BRIEF

Norsk lands Irish contract

NORWAY'S biggest computer manufacturer, Norsk Data, has replaced the UK's top supplier ICL at a leading computer bureau in the Irish Republic, Computer Enterprises Ltd, of Cork. CEL has installed twin Nord ND-100 computers at its Cork head office plus a smaller ND-10/s at a major customer, Verolme Cork Dockyard. All three machines are linked by the Nord-Net data communications system which will enable extra processors to be added in the future.

More ICL PoS kit

ALREADY a major ICL customer, the House of Fraser is installing an additional £1.2 million worth of ICL 9510 point-of-sale terminals and 9540 controllers. The 360 9510s and 36 9540s have been ordered by the retail group's Dingles division for its 19 stores in south-west England. ICL PoS kit is already in operation at another House of Fraser division, Binns.

EEC orders OCR

OPTICAL character recognition equipment has been ordered by the EEC Commission for over 50 applications involving forms filled in by alphanumeric handprint, pencil marks or typed using the OCR-B font. The equipment, due to go live in May, is an OCR Scandata 2250/1 to be supplied and maintained by Matra Informatique.

Still Honeywell

PAINT maker Blundell-Permoglaze is replacing its Honeywell 2040 with a £250,000 Honeywell Level 64/DPS as the first stage in a two-year implementation of a new network of Level 6 minis. The system, which includes a one-megabyte processor and five 100-megabyte discs, will be used for financial and stock control and order processing, using Honeywell TDS and IDS II transaction handling and database software.

Keypad for pence

DELIVERIES of 16-key keypads from Texas Instruments for Tangerine Computer Systems' Tantel viewdata adapter have now reached 10,000. Tangerine expects to take a further 40,000 this year, priced at "well under £1" each. Texas Instruments has used the keypads in its own calculators for several years.

£1m of modems

OVER £1 million worth of 1,200-bps two-wire full-duplex modems has been ordered by British Telecom from EMI subsidiary 8S Labs for delivery in September. The modem is a modified version of one designed in the US by Rixon and will be made in Feltham, adding to the 1,000 a month 2,400-bps and 48,000-bps modems already in production for British Telecom.

Telex order

TELEX message distribution equipment worth £90,000 has been installed at Chevron Oil's offices in London and Croydon by ITS Communications. The equipment includes a protocol converter to allow traffic from Europe via British Telecom's ILTAS International Leased Telegraph Message Switching service, to be routed via a switching centre in San Francisco using a different protocol.

Pilot orders

REDIFFUSION has announced a £250,000 package of pilot orders for the R800 distributed data processing system and the R1800 office system. Both systems link intelligent TVs, handprint terminals and other similar devices to minicomputers. The firm also claims £3 million worth of orders for its viewdata systems.

French unions paralyse DP research

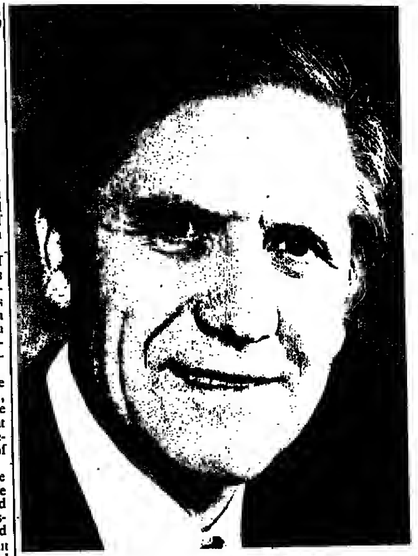
by Jack Gee

COMPUTER and data processing research in France are running a wide range of activities which have been almost totally paralysed since the beginning of March when 40,000 engineers, technicians and office staff mounted a campaign of protest against the government's new plans for national research.

Grenoble, the home of much of France's research in computers and peripherals, was the springboard for a movement which has spread rapidly over the past month as opposition has built up against a project to reform the state-sponsored National Centre for Scientific Research (CNRS).

Minister for Research Pierre Aigrain wants to make scientists, engineers and other personnel more mobile in order to demolish what he describes as a system of segregation between different fields of research.

CNRS staff are accusing the minister of trying to "dismantle French government research and hand it over to private industry." The Communist-dominated Confédération Générale du Travail (CGT), the most powerful union among CNRS researchers, is solidly supported by other unions.



SIR HENRY CHILVER . . . Industry continually at a disadvantage from the establishment of de facto standards abroad.

Electronics standards 'need to be imposed'

by Rory Johnston

STANDARDS need to be imposed on the UK electronics industry by law if it is to compete effectively in overseas markets, and public purchasing policy needs to be fundamentally changed to encourage new products.

Those are the main conclusions just reached by the newly reconstituted electronics "little Neddy", the development committee for the whole of the electronic industry within the National Economic Development Council.

Commenting on the proposals, committee chairman Sir Henry Chilver said the UK electronics industry was continually at a disadvantage from the establishment of de facto standards abroad, and the only way to combat this was through statutory standards within the UK. There would have to be a mechanism for policing these but what this would consist of had yet to be worked out.

Public purchasing could do little to help existing products, Chilver went on, so effort should be concentrated on areas where there were opportunities for new products, most notably in information technology. The government had to encourage firms to develop products that could be sold effectively abroad, he said, and this often meant collaboration between firms. Many times companies had failed to get together early enough to be able to tackle international markets.

The principles underlying public purchasing had to be changed, the committee said, including the idea that "value for money" should be sought at the expense of local suppliers. Other factors which had caused problems were manipulation of public spending by governments aiming to manage the economy, and annual budget cycles which led to "feast and famine".

The committee forcefully asserted the need for UK firms to co-operate in product development to enable them to compete with giant foreign companies. This required a change in attitude, Chilver said, but was seriously inhibited by existing policy on competition. Laws on monopoly and restrictive practices needed to be examined, and the whole structure of the industry, in particular the mix between large and small companies, needed to be sorted out.

Even inward investment from abroad was viewed with suspicion by the committee, which felt there was a danger that UK capability in vital technologies could be supplanted by foreign-owned firms.

An Information Technology committee has been set up to take a broader look than has hitherto been possible from the Computers and Office Machinery sector working parties, and this has been taking a particular interest in standards.

In addition, a manpower study has been initiated for the whole of electronics, not just computers, as hitherto.

The computer manpower subcommittee has commented on the response to its recommendations of June 1980, welcoming government concern but saying that training programmes are not properly co-ordinated and will be insufficient for when demand for skills picks up again.

Univac's report writer needs no programming specialists

BIDDING for the potentially huge market for writing applications programs without programmers, Univac chose its end-of-the-year review last week to launch its Mapper product into the UK.

Already sold in the US over the last 18 months, Mapper 1100 — an acronym for Maintaining, Preparing and Producing Executive Reports — is heralded by Don Bungblut, product manager for the 1100 series in the UK, as a "revolution".

It is written to run on 1100 machines with their existing operating system, and designed to initiate reports and create and modify files using plain language without the assistance of DP professionals. It can be used after two days of training, says Univac.

Bungblut cites a typical two-year lead time for developing new applications within large DP departments as evidence of the market potential of the new product.

Univac likens the organisation of the Mapper database to a series of filing cabinets with eight drawers, each holding reports in the same format. The user creates, stores and manipulates them as required, and can display them in full or in part.

Commands are grouped together by the software to create run-units of similar commands, which can also be used for distributed applications development linking several 1100 mainframes.

Existing US sales total 150 and include major users like the Santa Fe Railroad which handles 2.5 million transactions per day, says Bungblut. In a swipe at competitors, Bungblut says that 27 per cent of sales have been to replace other manufacturers' kit with 1100s running Mapper; and over half of them have knocked out IBM.

He claims that the System 3 market is particularly vulnerable and has brought sales to users who would not otherwise have been expected to upgrade to a machine as powerful as the 1100.

Bungblut dismisses IBM's SQL/DS, a high-level information retrieval language, claiming that it does not compete. He says: "There have got to be a lot of question marks over that product, and according to IBM it's at least a year away from delivery."

The rental of Mapper on an entry level 1100/60 supporting up to 100 terminals is put at £11,000 per month for the machine plus £985 per month for the product.

This is competitive with Nomad, the report generator for users available on the National CSS bureau in the US, if 25 terminals are used for more than 11 hours per month each.

Intel kit for Ethernet

by Donald Kennett

INTEL has announced plans to start supplying controller boards for the Ethernet local area network in the autumn.

The first products will be based on medium-scale integrated circuits (MSI) and designed to plug into Intel's Multibus backplane. They will work with Intel single board computer products such as the iSBC 80/30 and 88/40.

A very large scale integrated circuit VLSI, containing over 20,000 transistors, is being developed for use with the company's planned iAPX range of 8-, 16- and 32-bit processors and support devices.

It will also be used in later versions of the iSBC Ethernet controller, the first of which is said to be suitable for prototypes and systems produced in small quantities.

The Ethernet scheme agreed between Intel, Xerox and Digital Equipment specifies methods for using cable television-type coaxial cable, carrying data at 10Mbps to link up several hundred work stations to a variety of computer-based resources.

CAD/CAM 'key to success' in UK

by Chris Youett

COMPUTER aided design and manufacture holds the key to a successful UK engineering industry, said BL Cars boss Harold Musgrove when he opened the 1981 Computer Numerical Control Equipment exhibition at the National Agricultural Centre in Warwickshire.

Musgrove, who is a former Longbridge apprentice, said the Mini Metro highlighted the advances that could be made with CAD/CAM. "In a relatively short time we have installed and mastered some of the most advanced car-making techniques in the world today."

UK firms dominated the exhibition and many were exhibiting systems that could be used on the shop floor, programmed by simple commands such as "cut", "move" or "drill".

On the Delta stand were demonstrations of the graphics numerical control systems, GNC, Duet, Polysurf, and Dlad which can be used to define and present two-, two-and-a-half and three-dimensional shapes visually on a graphics terminal. The firm also offers a bureau service where users can walk in off the street and try their hand at CAD.

Westinghouse was exhibiting its Producer CNC systems which can be attached to many machine tools. These are sealed units and all instructions are keyed in via touch-pads. Programming is via macros.

The industrial division of Software Sciences had two systems on display. Its graphics numerical control package is based on a Digital Equipment PDP-11/23 mini. The second package, Swift II, is a CAD system that runs on Prime kit and can be networked up to large systems.

Manufacturing Data Systems International, a software house specialising in industrial applications showed systems based on PDP-11/32 and upwards machines.

The company is soon to launch Compact II, an English-like command language which has online interactive graphics and can be programmed by shop-floor workers.

Micros to aid house seekers in London

by Donald Kennett

PROSPECTIVE house purchasers looking for a home in south-west London could soon be helped by a new residential estate agency computer system which will link a group of 12 agents. Microcomputers at each branch will be able to provide instant details of properties in a customer's price range and print out specifications, irrespective of the instructing firm.

Half-commission property sales whereby one estate agent passes details to another and they share the agent's fee — will also be operated up for the members of the group in the 29 offices they run between them.

The system will be based on Altos Micro 16-bit processors in most of the offices (the larger ones will have 4-volume 5000s) running 40 terminals, linking at 1,200 bps with the central 5-volume 5000 which will be accessed via dialled telephone links.

It is expected that contracts for the system would be signed this week by members of the estate agents' group — which includes Chesterton, Friends and Falcke and John D. Wood — and the suppliers, London-based Applied System Techniques and Blue Chip Microsystems of Yeovil, Somerset, two systems houses which specialise in systems for residential estate agents.

The local processors will be used with Volker Craig VDUs, and various printers.

AST is supplying the Systimes, the communications software and some of the Alpha Micros, and both companies are supplying existing accounting software products developed for estate agents, as well as word processing programs and the jointly-developed half-commission system. Blue Chip has been discussing the system with the agents for the last 18 months, and AST joined in last year after the agents had had a rethink and considered proposals from Geest and Planning Research Corporation.

Massnet bridges mainframe gap

by Donald Kennett

SOFTWARE to build on the Hyperchannel 50-megabit-per-second local network to ease interconnection of application programs running in different types of mainframe, has been introduced in the UK by Tesdata.

Slough-based Tesdata is the European agent for Network Systems Corp, the US company which makes Hyperchannel. The software, called Masnet, has been developed over the last four years by Masstor of Sunnyvale, California, to provide some of the higher-level functions outlined in the International Standards Organisation's seven-layer architecture for Open Systems Interconnection.

The software is running on IBM and Univac processors on test sites including the Jet Propulsion Lab in Pasadena, and implementations in the US Control Data and Honeywell machines are planned for further customers later this year and early next year. First installations in the UK are expected early next year. Software for a three processor system is expected to cost about £80,000, with additional processors costing about £16,000.

Over half of the development effort, said to be likely to exceed 30 man-years by the end of the year, has been devoted to error handling, according to Tesdata.

A central part of the system is the Network Manager module, which uses a set of "Netcom" commands to enable Fortran, Cobol, PL/I or IBM Assembler applications programs to access the network sharing resources controlled by other processors.

The Network Manager interfaces to the network adapter driver software, which replaces the adapter software supplied by Network Systems Corp, and is designed to make the communications parts of applications programs easier to write and the programs themselves more portable between processors.

Inforex adopts parent's net

INFOREX, the US key-to-disc system maker acquired by Datapoint last year, has adopted its new parent's ARC coaxial cable network as the local communications element in the System 9000 distributed processing system it has just announced.

The network is re-modelled Ultrinet and it enables a variety of the company's system processors, such as the Infobase data management system, to share databases and peripherals in providing services to user terminals.

Other software available includes a multi-user Cobol conforming to ANSI '74 and support for a number of interactive and batch communications protocols used on IBM, Univac, Burroughs and Honeywell systems.

European operations vice-president Peter Tremmel said the company viewed the System 9000 as a key to its future growth. Deliveries are expected to run at this months from the time of ordering, and to begin in August.

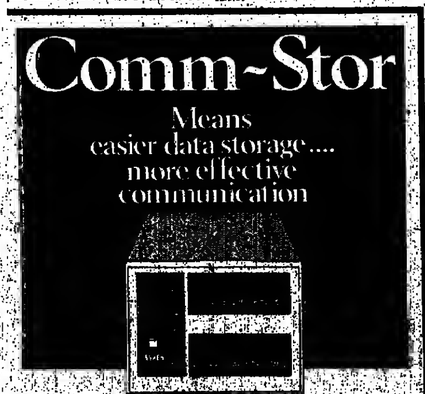
Banking package

AS part of its strategy to use its database products to develop business application systems, Cullinane has announced a banking industry package for online information management and data retrieval. The UK release will be July.

Integrated with Cullinane's IDMS database management product, the Customer Information System, or CIS, is a central repository of customer and account information with extensive cross-referencing capabilities.

Comm-Stor

Means easier data storage.... more effective communication



Comm-Stor from Intelligent storage and communication systems that can be linked to a wide range of data terminals, computers and telecommunications equipment. Switches dramatically cost per user by telephone and cuts postal costs and charges of fees preparing, re-collecting data. Solves information storage problems.

Telephone Action Desk on 0734 474621 for more information.

TDS TERMINAMEN Our technology your success

TDS

If Genesis is just an office block a floppy disc is just a loose-leaf record

Genesis is a ready-to-occupy prestige environment purpose-built for people who make a business of high technology.

Office, laboratory, prototype and light production suites are still available, from as little as 500 sq. ft.

From Genesis, you can be on the international scene in 20 minutes, via a direct M56 motorway link to Manchester Airport. And the M6 and M62 can take you to 50% of Britain's industry within a couple of hours.

Best of all, Genesis sites you alongside the leaders of the information-based industries. Your near neighbours include such organisations as Digital Equipment Limited, Data General Limited, UKAEA, Carborundum, Instrumentation Laboratory Limited, British Nuclear Fuels Limited, Engineering Polymers Limited, MatEval NDT and many others.

Detailed, comprehensive, objective Genesis Fact Pack is yours for the asking. All the data you need to make your next logical move!

READY TO OCCUPY FROM 500 SQ.FT. GET THE FACTS NOW!

RING WARRINGTON 39591

24-HOUR ANSWERING SERVICE

Write to Warrington and Runcorn Development Corporation, P.O. Box 49, Warrington, Cheshire WA1 2LF, or ring Warrington (0925) 39591 (24-hour answering service).

GENESIS BIRCHWOOD SCIENCE PARK Cheshire

MICRO NEWS

Real time speech synthesis from TSI

by Eileen Stainer

REAL time speech synthesis is no longer a dream of the future. Telesensory Systems of Palo Alto in California has developed a microcomputer system which can take an input of printed words and produce a spoken output in real time.

The Text-to-Speech system, as TSI calls it, uses two LSI-11s and an Intel 8085 as a central processing unit and the synthesis-by-rule speech production method. Only four systems are in existence at the moment, and the fourth is coming to the UK.

The unit costs about £18,000, but it is not expected to stay at that price. Initially, it has been built using wire-wrapped boards to allow more developments work to be carried out. When these are reduced to chip form, the price of the system should fall to £6-7,000 by 1982, according to TSI's European distributor, Modus Systems of Letchworth.

Typed words are input to the system using a digital wand, or it will accept ASCII code. The first task for the system is to recognise the words. It does this by performing a word recognition procedure using a dictionary of about 4,000 stored words. Obviously the larger the dictionary, the more accurate the recognition will be.

Speech is produced by using the *synthesis-by-rule* method which incorporates a library of stored phonemes, or building blocks of words. Intonation is an important result of this method and is obtained by synthesising the right phoneme in its correct position within the word.

The final result is by no means typical human speech, but it does have a natural flow and well-intonated quality. An analogy could be made to someone speaking with a bad cold, or a person speaking while holding their nose. Nigel Smith, marketing director with Modus Systems, likens it to the voice of a deaf person.

Three systems are now in the US, one being installed at Harris Wordprocessors and another at Boeing. In the UK, a system has been bought by British Telecom for development work on telephones of the future. Ideas will be fed back to TSI as more is learnt.

An interesting feature of the text-to-speech system is that the dictionary of words can conually be updated to include new vocabulary as it is used. If a word is not recognised from the start, the system will spell it out.

Telesensory Systems has produced a variety of speech products *similar to those of Texas Instruments* and National Semiconductor, but they are available at cheaper prices. Modus Systems sells these products off the shelf, and incorporates them into systems for industry on a consultancy basis, especially in the area of robotics.

Modus operates within the Mapcon scheme, the microelectronics applications project organised by the government; and is rated number eight in terms of volume of work. The company comprises 18 people, including two directors, and it currently has offices in Kent, Warwickshire, Yorkshire and Hertfordshire.

The company hopes to be moving into a £100,000 factory in Letchworth in the near future. The 7,000 square feet will be used to expand the manufacturing side of the business.

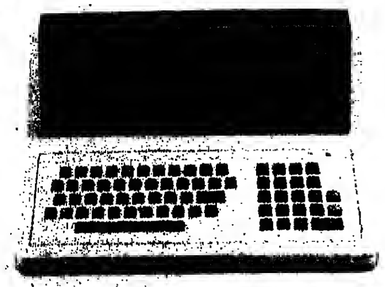
Using the waveform digitisation method of speech synthesis, which is the one used by National Semiconductor, TSI produces two series of boards, Series 2 and Series 3, which are at the bottom of the range. With 24 words in any language, the Series 2 unit comprising the speech chip and two ROMs, costs under £40, and the 64-word unit costs £84.

The Series 3 boards are equivalent to National's digitalker. About 400 words are stored on two 32K EPROMs, at a rate which TSI keeps as proprietary information, and the boards sell for £180 one-off.

Using the more complicated linear predictive coding method of speech synthesis, which Texas Instruments uses, TSI produces the Series 1000 board for £780. TI's price of an equivalent board is £1,200.

Another difference between the two is that TSI uses 12 stages of real data as opposed to TI's 10, which makes the predictive part slightly more accurate. TSI's storage rate is 2,200 bits per second, while TI's is 1,100 bits per second.

In the middle of this year Modus expects to carry out encoding of new words to the UK, although TSI supplies the encoding for 4,000 of the more common words. The charge per word will be £100, and an extra £100 for a personalised voice, or a foreign accent.



CASIO Computers of Japan has entered the personal computer market in Japan with a machine similar to Hewlett-Packard's HP-83. The FX-9001 has CMOS RAM which can be extended up to 32K-bytes in 1-Kbyte packages. The system comprises a 5½-inch screen that can display 16 rows of 32 characters, positioned above a keyboard, and costs $995. In June the company plans to introduce a 2,508 word Japanese-English translator containing a speech synthesiser with 263 English phrases.

Growth is in software

SOFTWARE technology will be the key to growth in the personal computer market over the next four years, according to a report compiled by US market research company Strategic, based in San Jose, California.

The report, entitled Strategies of Personal Computer Manufacturers, predicts that the $12 billion market for personal and small business computers forecast for 1985 will come about as much from the application of new software structures and techniques, as from declining prices and new developments in hardware.

Existing microcomputers require too much technical knowledge to be generally acceptable to the mass market, according to the report. The reason is that users more often require specific application programs rather than generalised packages that will perform their task and many others, which is the trend now.

Single application packages tend to be more difficult and time-consuming to write and maintain, and they are less portable. The report predicts that future software will be flexible integrated tools designed for developing a variety of systems. The report points out that Unix is the best existing example of an integrated set of tools. Microsoft, the company that developed it, is making it available for 16-bit microprocessors.

Most Unix programs are written in the Shell command language, which provides for connecting the output of one program to the input of the next. Formatting and typesetting programs are available so that an application has to include formatting.

'$11bn IC market in ten years'

INTEGRATED circuits in Europe will have a market worth $11 billion by 1991, according to Dr Ian Macintash, chairman of the microelectronics market research company, Macintosh Consultants. This is a five-fold increase in real terms from $2.2 billion this year.

Microprocessors will contribute to most of this growth with an estimated annual growth rate of 28%. Memories will also be a strong segment with an estimated growth rate of 20% per annum. By 1991, microprocessors will take $3.4 billion worth of the market and memories will take $3.6 billion, says Macintosh.

Other sectors of the market will be represented by MOS logic circuits taking $2.25 billion, bipolar linear circuits taking $1.1 billion and bipolar digital circuits taking $600 million.

Mackintosh forecasts that of the top ten suppliers to Europe in 1991, four will be from the US, four will be European and two Japanese. Last year six were from the US, three from Europe and one from Japan.

Microsense Computers Ltd

IN a story in Micro News on April 2 we reported on percentage discounts applied by Microsense Computers Ltd to a scheme to promote the sale of Apple Microcomputers to schools.

We now understand that the discounts quoted were not correct, and apologise to Microsense for any embarrassment or damage this may have caused.

We are assured by Microsense that dealers will make sufficient profits under the scheme to allow them to support their sales and service to schools.

FREE Catalogue of Data Communications Devices ...

Scicon computer services limited

Brick Close
Kiln Farm
Milton Keynes MK11 3EJ
Telex 826693

BLACK BOX CATALOG
Tel: (0908) 567567

The Black Box Catalogue of Data Communications devices contains descriptions, specifications and prices of over 100 unique, innovative products designed to help you solve your data communications problems quickly and inexpensively.

★ Phone or complete the form for your free copy ★

Name Title
Company
Address
Phone Telex

A Member of the BP Group of Companies

An important three day course for programmers and technical managers

ADA

presented by
Jean Ichbiah, John Barnes and Robert Firth
at the
Shepperton Moat House Hotel
on
13th, 14th, 15th May 1981

This comprehensive 3-day course covers full details of this new real-time language and its method of use. After the event, participants will be equipped to understand and use the Ada literature and will be in a position to pass on this knowledge to their colleagues.

The speakers, through their contribution to the Ada project, are in a unique position to give a detailed insight into this important development in real-time languages.

Fee £350 + VAT
A £50 discount on this fee is available to BCS Members

For further details contact:
David Seekings Conference Organiser
2 Duke Street, Bedford ☎ (0234) 48388

"I need money to make my ideas work -but who'll listen to just ideas?"

Like most people running a business, you'll reach a time when you want to expand. You'll need to borrow money. But how do you get your proposal down on paper to convince a bank manager?

Lloyds Bank knows it can be difficult. So we'll help you get the case together. One of our Finance Series handbooks "Making a small business bigger" has a section giving step-by-step guidance on how to present your case convincingly.

Our loans can help

We offer two types of loan specially geared to helping new businesses grow: Asset Loans of £5,000 to £25,000 and Enterprise Loans of £25,000 to £250,000 or more.

Come in and pick up the booklets – or talk to us about your ideas. We'll try to help.

More help for business
At the sign of the Black Horse

LLOYDS BANK

SOFTWARE FILE — by Claire Gooding

Overhaul service prolongs the active life of products

IF "product decomposition" makes you think of rotting software, then think again.

Sysalog of London is launching a service called Product Decomposition and Structuring, which aims to do for software users what a surveyor does for prospective house-buyers.

The idea is to provide a user's guide to existing software so that the maintenance and prediction of the software "life cycle" becomes easier. Or, in the company's words, "prolong the life of existing software by solving today those problems which went unsolved yesterday."

Sysalog is offering a diagnosis service, rather than the standard maintenance contract. Once the company has taken the software apart and offered its findings, it is up to the user to use the diagnosis to put things right, although Sysalog can, if requested, take charge of the remedy as well.

"As far as I know, there's nothing like it," said Sysalog director Malcolm Crosbie. "The idea of applying software engineering methods in reverse doesn't seem to have crossed anybody's mind.

"We have been using it ourselves as part of our standard methods in development projects. At the end of each stage we verify that the stages match up; it's almost like quality control. That means that when you've coded something it's then 'decomposed' to make sure that it conforms to the original specification."

One of the things that the PDS service concentrates on is documentation, which is often lacking in quality and accuracy. This is particularly relevant where a system is getting long in the tooth, and the people who maintained it have left or have been lackadaisical about amending the documentation.

The client supplies a copy of its compiled program source listings with any existing documentation, which are treated in confidence by Sysalog. The company then produces a proposal free of charge, including a delivery date.

If the client agrees, the "decomposition" then starts and Sysalog composes a dossier of details which aims to give what it calls "total visibility" over the software. This includes a description in terms of an external specification, and a technical file which describes functional structure, each function and its implementation and a description of control variables which influence the processing logic.

There is also a user guide – the idea is that it is up to the client to take the final action to put things right, and the documentation should make this possible. Sysalog also offers a one-day training course to familiarise the staff with the use of the PDS dossier.

Software which is in heavy everyday use or else is the mainstay of an organisation using it comes within PDS's scope.

"An operating system is typical of what we'd tackle," said Crosbie, "but we also deal with systems that large organisations have written themselves. We get customers coming to us with what might be the backbone of their installation.

"It's important to them to get it right, especially as it gets older and more problematical. A large, complex system propagates more problems, especially as the people who knew its history leave without documenting changes."

The Product Decomposition and Structuring service was adopted from its French developers Tesci-Software of Paris. Cost is according to the complexity and number of events being dealt with by a system, but Sysalog gives examples ranging from £3,600 for a one-day intervention and "audit" which spotted five major logic errors, up to £15,000 for a full-scale overhaul.

Other examples quoted are an individual project using 8,000 lines of Assembler, recently written, for which PDS provided £9,000 of accurate documentation and software extensions, and a "large user" RPG project which was documented for £600-£1,200 per program.

A Sperry Univac consultant discusses with 1100 users the results of the PMS performance measurement exercise.

How to monitor 1100 performance

A PERFORMANCE analysis service has been introduced by Sperry Univac so that users of the 1100 mainframe series can monitor the performance of their machines over a 12-month period.

The Performance Management Service will provide a regular series of reports over 12 months, some of which are illustrated in real time colour graphics. It was developed at Univac's Customer Support Centre with the idea of providing improved cost performance, which, Univac says, is more important in the long run than shipping extra hardware.

The exercise starts with a visit from the Univac performance analyst, who consults with the user to produce a review of what the system is doing and what it should be able to cope with, as well as the user's performance goals. The user supplies parameters for these factors and also the configuration of hardware and software.

The performance data is then taped and sent to the Customer Support Centre in London where it is processed through PMS to produce analyses of such aspects of performance as memory and processor use, and system balance. The summary of key measurements is part of a larger, six-part system profile which includes recommendations on "tuning up."

Although the fall in hardware prices has meant that generally there is less effort put into performance measurement and tuning, it is still worth the trouble in some shops. For example, the Swedish Ministry of Defence, which uses 1100s on a bureau basis, has found problems with heavy I/O requirements during its daily time sharing workload. The PMS study carried out discovered that by rearranging files on disc and holding some of the operating system in memory, response times could be considerably improved.

Broking on the Sord

THE latest specialist package from Midas Computer Services, a company which caters for the Japanese Sord microcomputer, is a comprehensive brokers' package designed to make everyday administration easier for the first-time users.

The Midas Insurance Brokers Software Package, MIBS for short, can be used for motor, commercial, general and life insurance tractions.

Information is automatically transferred between client/policy records and account records, and as well as a day book for every transaction, the system also allows special facilities such as change of status and selective mail shots.

Codata to use Xenix

THE Xenix operating system, Microsoft's 16-bit micro version of the Bell Labs Unix time sharing OS, has been picked to run on the 16-bit microprocessor from Codata, of California.

Codata states that it is four months ahead of any other manufacturer in adapting Xenix, which it says, is expected to become the industry standard operating software for Z8000-based machines.

Version 2

VERSION two of the Matchmaker package, which allows North Star Basic to run under the widely used CP/M operating system, is now available from Digital Devices of Tunbridge Wells.

The new version allows North Star Basic to both read and write ASCII program files, and can be implemented using one simple command.

Matchmaker's price of £75 includes VAT if cash is sent with the order.

Bookkeeping

A COMPREHENSIVE system for book publishers which caters for the opposite end of the market from Systemsolve's recently released Booksolve, has been launched by North London firm MAI which specialises in small business computing.

MAI's system runs on Basic Four range for in-house use, and provides real time services such as invoice and stock processing, sales analysis, calculation of sales trends and royalties and special titles.

ComputerWeekly brings you
COMPEC NORTH'81
Belle Vue, Manchester
June 23-25, 1981

For better communication with the heart of industrial Britain

The sponsors and organisers of COMPEC are proud to present the first extension outside London of that event – the largest, most comprehensive and most visited computer show in Britain. For details, send the coupon NOW.

COMPEC NORTH'81
To: Compec North, c/o IPC Exhibitions Ltd, Surrey House, 1 Throwley Way, Sutton, Surrey, SM1 4QQ
Please send us more information about exhibiting at COMPEC NORTH
Name
Company
Address

COMPANY NEWS

ICL France moves steadily back into profit in 1981

by Jack Gee

WHILE ICL struggles to overcome its cash flow crisis, its French subsidiary is chipping in by moving into profitability.

Over the past three years, ICL France has steadily increased its turnover, and its share of the market both in revenue and installed equipment.

This has been achieved in spite of a 35% increase in the value of sterling imports – ICL France imports the entire range of the parent company's products from the UK – and tough competition from manufacturers in France.

After making a Fr20 million (£1.8 million) loss in 1979, ICL France balanced its books last year and is expecting a respectable profit in 1981.

The spectacular improvement in the company's fortunes dates from the arrival in 1979 of Midhat Gazalé, a 51-year-old Egyptian-born IBM veteran, as managing director of the French subsidiary and vice-president of ICL Europe.

Gazalé has reduced staff from 1,200 to 800, principally by cutting down on administrative personnel.

Turnover, which rose by only 18.4% in 1978, took off with Gazalé's arrival in 1979 with a 26% increase and moved up again by 26.7% last year to reach Fr 611,100,000 (£55 million).

The company's installed equipment base has also shown a steady improvement. Its value rose by 17.8% in 1978, 18.4% in 1979 and 19.3% in 1980 (in current francs) to reach Fr 1,348 million (£121 million). This represents a regular progress of between 4% and 5% in constant francs.

Gazalé's success in pulling up ICL's leading European subsidiary by its boot straps is mainly due to his introduction of a new aggressive sales policy.

He says: "I re-oriented the sales force to look for new customers rather than pursue the traditional practice of base-churning. With 40% of the domestic market in the UK, ICL UK can live on churning the base. But, with only 4% of the French market, we cannot afford to."

So sales people are encouraged to go after new business. They can earn up to 50% more than their basic commission by selling a system to a new customer rather than to an old one.

Gazalé reports: "So we are steadily stealing contracts from the competition. We have just got a major contract with an eight-year installed IBM user. My sales team is very bullish, very bold. They are real tigers."

When Gazalé arrived at ICL France he found the sales force split into two vertically integrated teams, one for large systems, the other for medium and small. He merged them into a single unit and then put each area of France under the control of a local sales chief with broad powers of decision and responsibility for profit and loss.

Gazalé is now concentrating on building up sales in the Paris area.

Gazalé . . . "We are steadily stealing contracts from the competition. My sales team is very bullish."

Rapid riser seeks London quotation

by Kevin Cahill

NORSK Data, the Norwegian minicomputer manufacturer which recently announced record profit and turnover increases, has indicated that it will seek a London quotation for its shares in June.

The company, whose shares have risen recently from the UK equivalent of £33.00 to £51 on the Oslo Stock Exchange, is intending to carry out two technical operations on its shareholding structure.

Norsk is having a one-for-one scrip issue, which means that each holder of a current share will receive one share free. The company is also having a rights issue, which means that a current shareholder will have the right to buy new shares equivalent in number to those currently held at a price of £10, 40 Norwegian kroner.

It is understood that the company has already finalised arrangements to obtain the services of a London-based merchant bank and of a London stockbroker.

So far, the company has not made it clear whether the stock offers will take place before the London listing or at the same time. A percentage of the company's shares are already understood to be held in London.

The company will offer its shareholders an opportunity to buy one share in the Tandberg electronic company for every 10 Norsk shares held. The price of the Tandberg shares will be 3Nk, about 75p.

Norsk has indicated that the company has set itself a target of 40% growth in turnover for 1981, and unchanged profit margins. Recent announcements by the company of more than 50 orders for the Norsk 500 32-bit minicomputer and for flight simulators for the American F-16 fighter bomber clearly show that the target is realistic.

Hit by high sterling

by Keith Jones

HIT by the high value of sterling and intensifying international competition, Brown Boveri Kent has reported a net loss of £595,000 for 1980 compared with profits of £3,849,000 in 1979. At the same time turnover increased only marginally, from £86,399,000 to £89,410,000.

The company is a major supplier of industrial measuring instruments. Computer-based process control equipment accounts for no more than 10% of total turnover at the moment but is seen as a big growth area.

The main product is the P4000 system which is based on PDP-11 and LSI-11 machines from Digital Equipment.

Brown Boveri Kent is 54.5% owned by the Swiss-based BBC Brown Boveri organisation, and employs 4,000 people in the UK and another 2,000 overseas.

Modcomp results disappointing

by Keith Jones

FOR the first year under the chairmanship of finance expert Lex Giles, Modcomp has reported turnover and net profit figures that must be something of a disappointment to him. In May last year Giles predicted that 1980 turnover would be 20% up on 1979, and that the company's poor profit performance early in 1980 would improve to the extent that record profits would be reported in the fourth quarter.

Instead, turnover increased by a much more modest 13% to just over $81 million while fourth quarter net profits plunged to $695,000, 42% down on 1979. Net profits for the whole of 1980 at $3,810,000 were 18% lower than in the previous year.

Modcomp has blamed its poor fourth quarter profit performance to a large extent on an adjustment of $2,300,000 that had to be made to its inventory figure. It resulted from the discovery of a difference in physical and book inventory when the year-end check was taken, Modcomp says that it is continuing in its efforts to determine the reasons for the variance.

Late last year Modcomp was vindicated by the US government's Securities and Exchange Commission at the end of a three-year SEC investigation into the way its accounts were handled in the years 1973/76.

The SEC had suspected that a $4 million loss on $7.4 million sales in the second quarter of 1976 was the result of Modcomp adding orders to revenues before shipment during 1973/76.

Lex Giles blamed Modcomp's sluggish performance in 1979 on the SEC investigation and its deterrent effect on prospective customers. In 1979 turnover increased by 11% while net profits saw a rise of less than 6%.

One encouraging feature of the 1980 results was a 26% increase in fourth quarter turnover to $24.8 million.

Modcomp is based in Fort Lauderdale, Florida and has its European headquarters at Wokingham, Berkshire.

Boost in CDC profits

CONTROL Data Corp in the US has announced first quarter results for 1981 with profit 14.48% up on first quarter 1980 at $40.3 million ($35.2 million in 1980).

Turnover was up just under 10% at $972 million, against first quarter 1980 results of $884m.

Marvin Rogers, CDC's chief executive officer, attributed most of the profit improvement to contributions from the computer business area of the company.

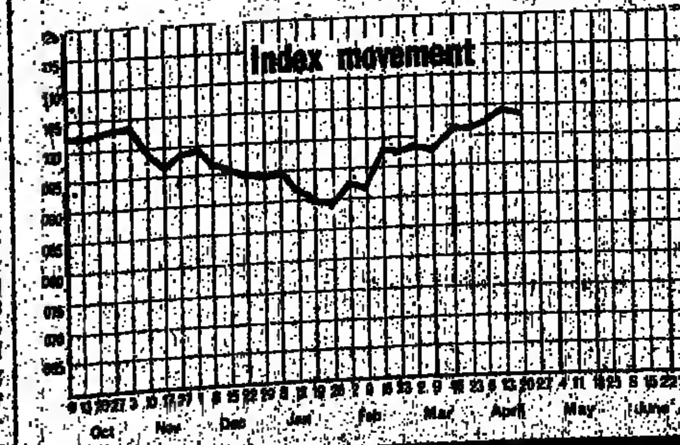
Earnings were helped by a lower tax charge.

CW SHARES TABLE

Date: 16/4/81 — Index: 104.46 Change: –0.22

Pence		London Stock	Pence		$		US Stocks	$	
1981					1981				
High	Low		Price	Chge	High	Low		Price	Chge
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

The table shows the closing prices in America on Thursday and the mid-day prices on Friday for London. The share index is based on the prices of the UK companies in the table. Highs and Lows have been adjusted where necessary.
** Shares traded under the Unlisted Securities Market or under Rule 163(2)(a).*



Bureau's shares boom

by Kevin Cahill

SHARES in the West Country based computer services group Computer Services (South West) rose to 310p on news of a £100,000 rise in turnover, from £457,000 in 1979, to £557,000 in 1980.

Profit pretax rose from £80,000 to £101,500.

The company, which operates from Plymouth, runs a bureau service and has announced plans to buy two ME29s from ICL.

The company has been an ICL user for 13 of its 15 years of operation, and managing director George Knight says that he is quite confident in buying ICL equipment, despite the company's well-publicised financial difficulties. Computer Services plans to invest over £200,000 in new equipment, principally with ICL, in 1981.

Ownership of the company is almost entirely local and dealings in the shares were only reported half a dozen times last year.

A local newspaper quoted a London stock jobber, Pinchin Denny, as saying it was trying to find a market for the shares but was having difficulty in finding anyone to sell.

Plymouth stockbrokers were also quoted in the same paper as saying that they had a list of potential investors, but that stock seldom came on offer. This is hardly surprising, since dividends on the shares rose from a healthy 17.5p per share to 25p, making a final payment of 18p a share for 1980.

'Good gain' in NCR orders

NCR chairman William Anderson has announced a "very good gain" in incoming orders during the first quarter of 1981.

Comments on the order book accompanied details of first quarter revenues which were 8% up on last year at $27.55 million. Turnover rose 12% to $733.3 million.

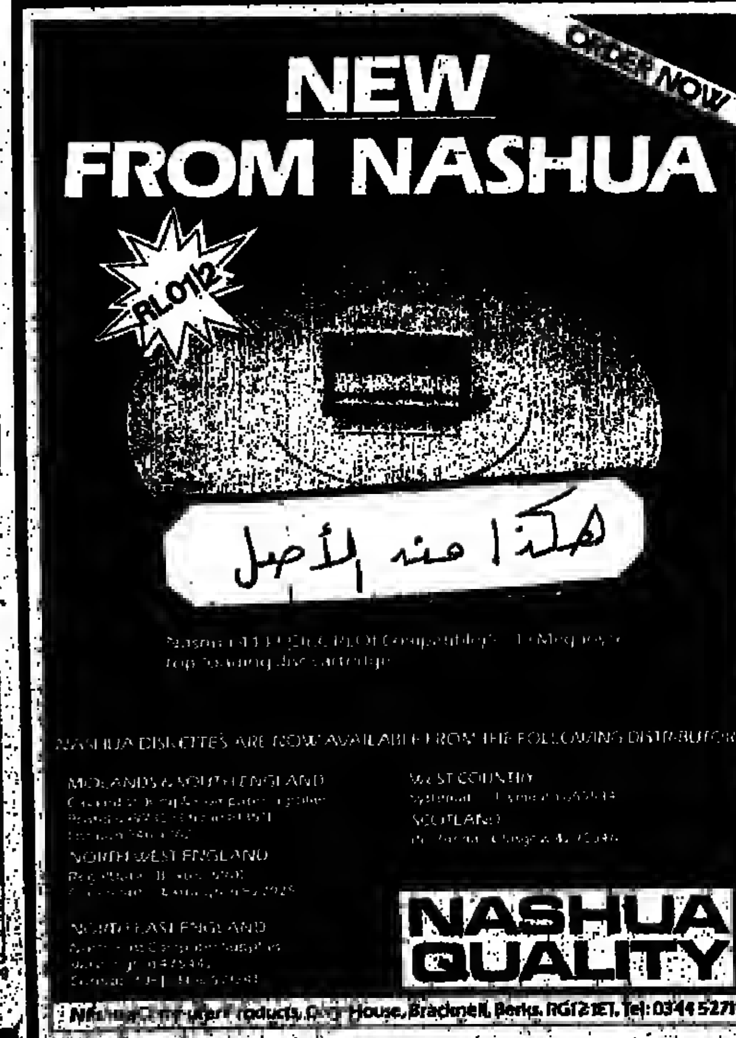
Anderson blamed the strengthening dollar for an erosion of revenues. More than 50% of NCR's business is done overseas.

CCF up 29%

CONSULTANTS (Computers and Financial) the specialised City based bureau and software house which placed its shares on the unlisted securities market last week saw its price rise to 115p within 24 hours of the commencement of [illegible]. The placing price was [illegible].

London takeoff

AMDAHL Corp's shares which began trading last week have risen to £18¾ on the London Stock Exchange. The rise of £2 is attributed by stockbrokers to strong European interest in the company and to the relative scarcity of computer stocks on the London market.



GILB'S MYTHODOLOGY

Keyboard joysticks for structured text handling

IN connection with the automated Design by Objectives project, described in the previous Mythodology column, my colleague Lech Krzanik of the University of Krakow and I have designed a method of system command keyboard utilisation which might have some general interest. It employs sound humanised-input design principles.

Our system is, among other things, a structured text handling system for multi-level hierarchies of multi-dimensional design specification and analysis. As a consequence we need a variety of devices for searching, storing and retrieving documents.

We also need the capability to use the screen as a "window" to look at a document which is much larger, in terms of character content, than we can display on the screen, in all four directions.

We do not pretend the design is ideal, but we do hope it serves as an idea source for the reader.

1. The first general principle of this design was that all functions should be available with a minimum of keystrokes (one; and no need to "hit return").
2. Then, we wanted to avoid special features such as our graphics tablet and function keys. This is because we wanted a design which would be highly portable to other systems and to a minimum Apple system. So we used only the keys commonly found on the keyboard. No escape or control keys were used.
3. Mnemonic keys were used wherever possible, to make learning easier and increase reliability. So, even when the explosion function (jumping to more detailed documents from a higher level) *can* be called from depressing any one of the lower (geographic symbolic for "go down in the hierarchy") keys, ZXCVBNM, we also included the possibility of using the "E" key to give direct mnemonic.
4. Since in our application it is a frequent and important function to jump up (implode) or down (explode) in the documentation hierarchy, we reserved the entire set of uppermost number keys (1-9,0) for moving up in the hierarchy (one level at a time, the *next* level). A special "Jump to the uppermost level of this hierarchy" key is given by the "T" key for Top of hierarchy.
5. Conflict in choice of "which mnemonic is best" was often solved by assigning several meanings. As additional examples to those quoted above, the P (Print) and W (Write) keys have exactly the same meaning, and so do the H (Help) and "?" keys.
6. Where there is no conflict, the user does not have to be concerned with whether he or she is in the right shift (upper/lower) mode. Either mode is accepted.
7. The cursor movement is controlled by the Auto-DBO Joystick. This uses the Left and Right arrows for left and right movement. As supplementary mode the spacebar can be used for right movement (natural and easy to access), and the semi-colon can be used instead of the left arrow.

The reason for this is that on the Apple the ";" is immediately to the left of the left arrow — so that accidentally pressing the wrong key will still have the desired effect (and at least no undesirable side-effects).

The return key was chosen for upward movement, because it is approximately above the arrow keys, and for the same reason the "/" slash key was chosen for downward movement.

This arrangement allows for an intuitive movement of the cursor.
8. The DBO Joystick is expanded by similar geographically chosen keys for moving the cursor to one of four extreme corners of the document. This is similar to the "home" key function found on many keyboards, except that it allows access to all four corners, and it moves the cursor, if necessary, outside the immediate viewing window to the "virtual corner" of the present document.
9. We also tried to "group" sets of keys which were used for similar functions. The three keys to indicate various updating functions (UIO) are physically on the keyboard in a single row, yet we have also managed to give them a mnemonic meaning: U= Update horizontally (normal sequence), I= Insert, vertically — the vertical "I" is also a visual reminder, and Letter "O" for One item update. Both the I and O are near to the main "U" symbol, which helps to remind us of their function.

Similarly, the ASDG cluster for search functions, with the exception of the intervening "F(ormatting changer)" key, are not only close to each other on the keyboard, but also contain mnemonic meaning: S(earch in the present DBO form), A(ll forms to be searched in this project), G(roup of forms of same type to be searched), D(irectory of all places where search key matched is to be retrieved again).

If the "double mnemonic" of geographic location and meaningful key is not enough, the user can access a keyboard display by using the help ("?") function.

Tom Gilb is an independent consultant, lecturer and author on computing topics.

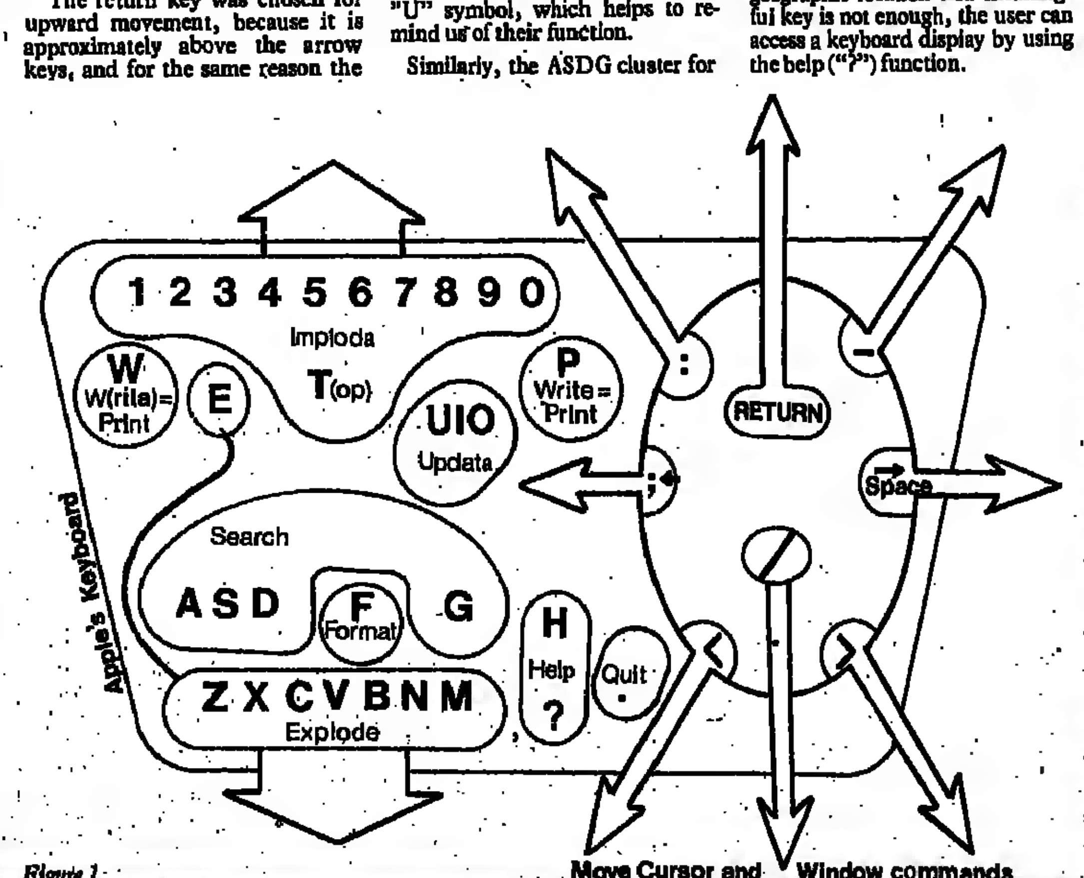


Figure 1.

FOCUS

The major art of de-delegation

WRITING in a recent computer journal, a well-known training authority suggested that it was essential for the DPM to know when to make a decision, how to avoid alienating staff and how to establish problem priorities.

A more practical listing would have included advice on how to defer or delegate decisions, retain staff and avoid any suggestion of problem-solving.

Missing from the article was any mention of those attributes of the DPM's operation, those of good luck, good timing and the most important art of all, that of being in the right place at the right time. These vital requirements are seldom encountered in the academic world of DP training, despite being everyday factors for those involved in the computer industry.

Being in the right place at the right time is a matter of skilled dedication and not a little luck. It is unfortunate if the DPM happens to be closeted with the company chief accountant when news comes through that the system has gone down in mid-invoice production run and that repairs are expected to be more a matter of hours than minutes.

Far better if the DPM had been away at the critical time, possibly on a course, at a seminar or visiting an exhibition. Even better if he had been lunching with the service or sales manager. Bonus points, of course, would have been scored if the DPM had been absent lunching with rival manufacturer's sales teams.

The professional DPM knows exactly when and to whom he should delegate. More importantly, he appreciates the major art of de-delegation. Having left the responsibility for the new sales application in the capable hands of his systems manager, he has been able to view with some detachment the

- delays in reaching analyst/user agreement on requirements;
- subsequent struggle by the program team to comprehend the requirements and reach a hesitant compromise with both user and analyst;
- reluctant acceptance by the ops team of a system which has more obvious leaks than the forward planning department of IBM;
- subsequent rejection of the application by the user team, backed and supported by their senior management.

It is at this stage that the DPM will reassert control. He will reassure the users and management that he personally is taking command while reaffirming to his own senior management his overriding concern and regret that he had not taken over at an earlier stage.

Assurances would be given that the senior analyst involved will be moved to a less demanding role, such as program documentation. Meanwhile, the number two in the analyst team will be assigned the task and informed that his future plus a large bonus will depend on a speedy and successful achievement.

Similar treats and promises will extend down the line, the ultimate goal being that the DPM gets commemorated for a fine achievement.

The dedicated DPM should pay more attention to his own installation holiday lists than to his own working schedules. Being absent when trouble arises should be a matter of good timing, not pure chance. Extra special bonus points arise if the DPM has to be recalled from his Greek Island holiday to sort out installation difficulties. The well-prepared DPM will in fact keep his bags packed, and not stray too far from the phone.

With only a small amount of prior planning and anticipation, the DPM should be able to find himself in the right place at the right time. Essential good management requirements.

Alan Simpson

10 YEARS AGO

From Computer Weekly of April 22, 1971 . . .

The BCS was asked to act as an independent assessor of the 1971 Census, to safeguard its confidentiality and oversee the form in which statistical results were produced . . . The central purchasing agency for the Russian car industry, V/O Avtopromimport, ordered two System 4/62 systems from ICL, worth £1,800,000 . . . IBM introduced Model 22 to the System 360 range . . . The major growth areas for minicomputing were to be message switching, data acquisition and instrument system automation, according to the Electrical Research Association.

DOWNTIME

Back to Square 1 with telesoftware . . .

LOTS of fun and games are in store for you if you are planning on taking advantage of telesoftware and picking up programs for your home computer from Prestel. So I gather from my colleague Peter Laurie of Practical Computing, who is tied up with all kinds of practicalities now with his telesoftware project.

It seems that the Prestel software is liable to mess about with spaces, so all spaces in source code have to be converted into ¾ signs. Then naturally all ¾ signs have to converted into Esc ¾. Escape is something funny anyway, and Carriage Return Line Feed just blows your mind. The resultant Basic source looks to my eye like something copied off the wall of an Egyptian tomb.

You could, of course, have a program in your micro to convert the text back again, but since this would have to be different for every machine you would probably end up writing it yourself.

These things make one wonder, do they not, about the whole idea of computers making life easier and reducing drudgery. The great thing about Basic is that it is easy to understand, right? Not when it looks like QR¼%&£//@ it isn't.

Then we have the march of Progress. Years ago, we were toggling in 23 16-bit hex word bootstraps every time the power failed, thinking, "Soon, we won't have to do this any more." True, we just have to do other boring things.

I suppose part of the fun of having micros is doing things for yourself, but you can see why Dijkstra is rude about them, and why George Coulouris of QMC has suggested that maybe Prestel is not the greatest thing since sliced bread.

Anyway, the Practical Computing team tell me that quite a few people are already taking ZX80 programs off their Prestel pages. How do they do it? By copying the programs down in longhand!

. . . not to speak of re-inventing the wheel

I HAVE recently acquired a watch-calculator. It's good for impressing your friends for about a week, until they get one that is even cleverer, such as, it can not only play Happy Birthday to you on the right day, it can also get BBC2.

Anyway, looking at mine I have been thinking: Isn't it wonderful what microelectronics can do nowadays, and then I have been prompted to think: Now wait a minute!

This machine is a watch, a stopwatch, and a calculator. It is highly accurate. Fine. It was 14 years ago that I was given a Swiss mechanical watch. It was highly accurate, and included a stopwatch. On top of everything, it had a circular slide rule around the outside! So what has my new machine got that that had not?

The electronic beast can add and subtract as well as multiply and divide, but it is usually quicker to do that in your head than to key the numbers in. It has eight significant digits, but who needs them? The electronic stopwatch can measure hundredths of seconds, but since it is impossible to push the button with that accuracy, that is somewhat irrelevant.

From the ergonomic point of view, I fear the old ways win hands down. With the mechanical watch it was possible to read the dials of all the different functions at once, without switching from one mode to another. And, of course, setting a digital watch is always a pain. Winding the old one was of course good exercise for the fingers.

So, gloom has descended upon me from the success of my purchase. You may wonder what happened to the wondrous Swiss machine. It suddenly went haywire and started running hours fast a day. Then someone burgled my flat and stole it. So if someone tries to sell you a slide-rule watch that runs on Venusian time, let me know.

Of course, there is the point that the silicon variety is considerably cheaper. Nor will the slide rule say 58008 5.31573 (upside down) for you. I wonder whether flashing 07734 (upside down) to young ladies on trains will get me anywhere?

"In order not to neglect character-building, we make them use the school computer in a cold bath."

Fail – unsafe

TALKING of the ergonomics of electronic timepieces, the alarm clock a certain computer company gave me as a present has a marvellous feature. How do you tell when the battery is getting low? It's very simple — the display works OK but the alarm simply fails to go off! Great idea. In these days of short-time working, we need more people to be late to work in the mornings.

A friend had a calculator which kept giving wrong answers, and on taking it back to the shop he was told, "Oh, that just means it needs a new battery." And another calculator to tell when the answers are wrong.

Hobson's choice

"ALL items subject to availability", it says on the bottom of British Rail menus. I have been trying to work out what on earth this means. One might suppose it is another way of saying, "If we have run out of it, you can't have it," in which case either British Rail officials have the mentality of lumps of granite or they think their customers have.

No, I have worked out a more plausible explanation, another example of highly skilled British buck-passing. It means, "Our stock control system is NBG."

Unsporting

OUR very own homegrown Teletext is being launched as a trial in Chicago, with the champagne bottle being metaphorically broken by Information Technology Minister Ken Baker. Apparently Marshall Field, which is running the experiment, plans to overcome the shortage of pages on teletext by having different times of day, e.g. recipes, but no sports, in the morning for housewives. Wait till Women's Lib hears about this!

ComputerWeekly

Quadrant House, The Quadrant, Sutton, Surrey SM2 5AS

Thursday, April 23, 1981

New, aggressive mood in Neddy

THE National Economic Development Council is, sadly, one of the most uninspiring institutions in all of British public life. Ask a representative member of the public what the Council is and the response is likely to be blankness. People in industry, who should be most directly affected, can easily get the feeling that Neddy's output throughout its life has been largely platitudes and empty generalisations.

So it is refreshing to hear the latest proposals from Sir Henry Chilver's electronics "little Neddy", controversial as they are, and to see a new mood of aggressive action in this group.

NEDC was founded by the Wilson government with the express aim of producing in Britain a "high-productivity, high-wage economy". The two sides of industry were brought together with government in what was seen as an effort to convince the industrial workforce to agree to increasing productivity. Management should, in theory, need no such convincing, but curiously Neddy has spent much of its effort crusading in this area.

Evidence of Neddy's success is not easy to spot. So much of the sector working parties' output has consisted of reports filled with phrases such as "greater emphasis should be placed on such and such", "industry needs to be encouraged to . . . ", "there should be a national focus of responsibility for so and so", "there needs to be a more positive commitment to . . .", "government must pay particular attention to . . .".

Small wonder that British industry has not been galvanised into activity by these woolly clarion calls, though it may be that things would now be worse had they not been made.

□ □ □ □

Mrs Thatcher's government recognised on taking office that much effort was being wasted at Neddy, and several sector working parties were abolished. The principle of the organisation was, however, approved. Chilver's Economic Development Committee for electronics, re-formed earlier this year, covers the work of several sector working parties, and has decided to do more than simply issue reports to government.

"We have to put pressure on companies," Chilver says, referring to his calls for far greater effort in automating, improving productivity in other ways, and especially in cooperating with other firms to develop products which can sell overseas. The mix of company sizes within the UK electronics industry is affecting our ability to compete with foreigners, he says, and positive steps (implying mergers and demergers) need to be taken promptly.

Other more specific proposals include a much greater effort to help UK industry through public purchasing. Too much emphasis, Chilver bravely asserts, is put on not wasting taxpayers' money. He flies in the face of those who say UK industry should not be cushioned by a captive market from the harsh realities of competition.

The need to proselytise among industrialists brings to mind Information Technology Minister Kenneth Baker's often-repeated description of his role: that of a crusader for the new technology. Why, one is prompted to ask, is it necessary to spend so much effort convincing British businessmen of the need to improve their productivity and their profits?

The whole idea of "free enterprise" is that it is supposed to provide its own incentives. Perhaps the fact that state-inspired Neddy and offspring of Neddy are having to get tough means we need to think of some alternative incentives.

1984 and all that . . .

THIS week's example of the curious things people say in the media about computers was sent in by C. M. Jones of New Barnet, who wins £5.

Would you believe that a none-too-nimble nonagenarian would be crossing Southgate Road, Potters Bar, at 8.10 am? Neither would members of Hertsmere Council's Potters Bar road safety committee. [illegible]

Barnet Press

LETTERS

Need to re-organise education for DP

IT is hardly necessary to state that Professor Conway (CW, March 12) and John Cookson (February 19) are both correct in highlighting teacher training of computer teachers as an immediate priority.

I cannot, however, share Professor Conway's pessimistic view that only one authority takes such teacher training seriously. We have been particularly struck in recent discussions across the country by the response of LEAs to these priorities and to MEP (government Microelectronics Education Programme) initiatives in this area. The majority of LEAs have either been steadily engaged in supporting in-service training for some time, with a very low publicity profile, or else are urgently reorienting themselves to take on the task.

Nevertheless, the fact that this applies only to the majority and not to all authorities is sufficient reason to reiterate his hope that LEAs will not use the intervention as an excuse for avoiding their own financial and policy commitments.

MEP can start the ball rolling in each region of the country, but unless each LEA undertakes financing of teacher release time and the low attendance costs of short courses and spends capital funds on hardware purchase, that ball will not travel far and the game will certainly cease to be played after the end of the programme in 1984.

There is, however, another issue here. Underlying these award-bearing in-service training courses is an assumption which does require further investigation. It should not be readily assumed that the two very distinct groups of teachers described above can be catered for by the same or similar course prescription. Teachers are not necessarily well trained to employ the computer innovatively in the study of subjects such as geography, science or languages by being prepared in the same way as teachers of computer studies. If computer literacy for a wide range of teachers means anything at all, it requires an approach rather more fundamentally rethought than that which solely involves training for the computer priesthood.

In fact, both priesthoods, that of education as well as that of the computer world, face the need to deskill many of the tasks involved in using and applying computers and organise computer education in such a way as to promote democratic access to computer power, not only for all teachers, but eventually for the public at large.

JOHN S. A. ANDERSON
Deputy director
Microelectronics Education Programme.

Advantages of relational DBMSs

THE comment in Software File of March 26 that there has been a great deal of sound and fury over what is and is not relational certainly agrees with my own experience, and reinforces my belief that in our industry there are many who lose sight of the forest while staring at individual trees.

Probably the most widely recognised authority on database management systems, James Martin, writes in Principles of Data-Base Management, that database management systems are described by the way they represent data to the user. He then proceeds to discuss hierarchical, network and relational structure models and concludes with a description of the advantages he feels a relational DBMS should offer.

The principal advantages include:

- Ease of use — easily understood two-dimensional tables.
- Precision — relations between "tables" are precise in meaning.
- Security — sensitive data can be moved to separate files and protected.
- Relatability — maximum flexibility in relating records from different files.
- Ease of implementation — storage and retrieval of files in normalised or tabular form is less complex, and such files lend themselves more readily to rapid searching by specialised hardware and software devices.
- Data independence — if the database is in a normalised form with data independence in the software, the data can be restructured and the database can grow without, in most cases, forcing the rewriting of application programs.
- Data manipulation language — when the data is organised into flat structures the manipulation sublanguage can be simple to use and powerful in its range of options.

The potential user of any of the growing number of database management systems now available would be well advised to examine how well his requirements are met in each of these areas before committing funds, management attention and the implementation time necessary to achieve real benefits.

LARRY KURTZ
Sales manager
Doric Computer Systems.

Visicalc and piracy

B. J. BIDDLES questions (CW, April 2) the assertion in Printout magazine that Visicalc has been so badly pirated that there were two and a half times as many bootleg copies as legitimate sales.

Printout's investigation was targeted specifically at piracy of programs on cassette. It was this inquiry which turned up two and a half times as many bootleg copies as originals. However, we did encounter pirated copies of Visicalc, plus various programs designed to bust Visicalc's software protection. These were piously described as "back-up facilities".

There is very little doubt that massive, and in some cases systematic copying has contributed to the collapse of the cassette software market. It will be interesting to see what happens to the new breed of more sophisticated microcomputer programs now struggling for commercial survival.

JULIAN ALLASON
Publisher
Printout Magazine.

Portability of Unix

WITH reference to Mark Potts of Rair's article on Unix (CW, March 12), I should like to point out a mistake:

". . . it has a tailor-made system language, C, selectable on a per-user basis . . ."

"C", in fact, as pointed out earlier in the article, is the high-level language in which the system and most utility/application programs can then be used as commands, accessed through a very elegant (Algol-like syntax) command string interpreter termed the "shell". This itself is a C-written utility program which uses standard Unix facilities to execute other programs, passing them arguments and testing return values in much the same way as a function might be called in an interpretive language. The important point being that the command set is not built into the shell but, as you imply, may readily be added to on a per-user basis.

To expand on the main point of Potts' article, that of Unix setting a 16-bit standard, he concentrates mainly on the newer microprocessors (Z8000, M68000). I would like to suggest that this is too narrow a viewpoint. One of the great advantages of Unix is that it has been successfully ported on to a wide range of processors, and although each of their architectures is substantially different, Unix still presents a uniform user interface, conveniently masking from the user the hardware vagaries. This, in a mixed processor environment, allows the easy porting of software, but more importantly the easier porting of manpower!

R. A. MASON
Chairman, European Unix User Group
Dept of Computer Engineering,
Heriot-Watt University.

Much kneaded solution . . .

IN response to John Fairweather's problem (CW, March 26) of getting bits of rubber all over the place, I would like to share my own solution. That is the kneaded or putty rubber. This great invention erases pencil but does not create bits. Instead, you simply pull off the used pieces and drop them neatly into the bin.

Kneaded or putty rubbers are made by both Windsor and Newton and by Rowney and are available from artist's shops and some stationers.

TOM POVEY
Software Engineering
Burroughs Machines,
Cumbernauld,
Scotland.

Liveware File by Don

GOODIES FOR YOU

ALWAYS KNOWINGLY LESS EXPENSIVE
Show us an advertised or quoted price lower than we've invoiced you within seven days of ordering and we'll refund the difference or renegotiate your order

01-688 2724/6
COMPUTRADE
Telex No.946179

OP SPOT — by Paul Fisher

Tradition obstructive in the computer world

FOR one so young, the computer trade is remarkable in having such a well-developed sense of tradition. True, this leads to security in a changing world, but one of the potentially destructive aspects of any traditioo is that it can freeze relationships between different groups of people.

To keep to the traditional mould, princes must remain princes and commoners common. Aud, according to a venerable computer trade tradition, ops do ops and designers do design.

Mike Ellis will have none of this and contends that the ops department, and not just the systems designers, both have a responsibility in the development of new systems. As things stand at the moment, operations exists to keep things going, aod systems to drive the business forward. So long as that division of labour is maintained, operations must deliver the level of performance to which it has been committed by tbe systems designers.

Says Ellis: "operations has little time to devote to planning systems which will not happen for six months, one year, two years. The problems of today, with a CPU failure, a tape read error, a JCL error, the loss of a production output report and so on, always take precedence."

"No wonder," he continues, "systems analysts have tended to identify closely with the business user and treat business functionality as the prime consideration."

Ellis has two lists of questions, one for ops managers and the other for systems managers. To the ops manager implementing new systems he asks:

- Do you dread every new system implementation?
- Does it cause upheaval in your department?
- Does it disrupt existing schedules?
- Are there always unpleasant surprises such as, I didn't realise I had to run this new job on payroll night?
- Does input exceed estimates you have been given?
- Do you sometimes go back to the old system?
- Is training and documentation often lacking?
- Does systems oversell its work to the users?
- Are new systems more convenient to the user than to operations?

In the best tradition of a women's mag, if you have answered yes to most of these questions, you are suffering from one-sided systems development.

Such lopsidedness, according to Ellis, is due to development concentrating on business requirements at the expense of operational requirements.

To the systems manager, Ellis asks that he or she seeks out the views of the operations department on the following subjects:—

- Method of file control.
- Type of run to run controls.
- Method of closing down the on-line system.
- Points where the system is restartable.
- Standard layout of parameter card.
- Training needs.
- Documentation requirements.
- Service levels for production of particular output reports.
- Type and extent of tests.
- Percentage availability for particular on-line systems.
- Convenient time for fresh implementations.
- Existing operational problems.

Ellis is firm in his belief that the ops department is best qualified to decide these matters. Too often the systems analyst makes assumptions about what the ops department wants, when in some cases that analyst hasn't even been inside the computer room.

Enter the operations analyst, a specialist systems person with a first loyalty to operations. Ellis, an ex-systems man who now numbers himself among operations people, says: "The onus is on operations to make the change."

"Systems designers design a system onee. Ops run it day after day." Mike Ellis, the operations development manager with Littlewoods in Liverpool, is encouraging the emergence of a new role in large and medium-sized installations. He sees the operations analyst bridging the gap between systems and operations . . . .

Hardware has a tough time in land of wealth and waste

ANYONE who has spent time in the Middle East has a lot of wealth and waste tales. They are the kind of tales which have a fascination for those who have just escaped, from one bill to the next, through another British winter.

Take Kuwait, where they tend to use the most up-to-date equipment and appear to operate as a trial area for IBM. But by all accounts, computers in Kuwait tend to get broken. An IBM 360 was dropped and dented at the quayside. Computer rooms are swabbed out with a mop and a bucket of water. A 370/158 was forked by an erratically driven fork-lift truck.

In fact, bad driving and mangled US hardware, cars included, were very much part of life in Kuwait for Mike Waters. He currently divides his time between consultancy work and MVS and VS/1 lecturing work with Protocol Operations, of which he is an associate director. Back in 1976 he went to Kuwait to teach operations on a one year contract and came home two years later.

He lived in Kuwait City, a place with a million inhabitants and 600,000 cars. With high wages and petrol at 12 pence a gallon, the place is a car nut's paradise. Waters drove a V8 Impala which, he insists, was "not flash for out there".

Apart from roaring up and down desert motorways in his modest car, Waters took up the eccentric hobby of photographing the wrecked cars which litter the sand dunes. People in Kuwait give directions according to the wrecks en route: "Right at the Chrysler New Yorker wrapped round the lamp post on such and such a corner and first left after the overturned Lincoln Continental."

"I'd go back there," says Waters. "If you are rational about the place and prepared to adapt, you can have a very good time."

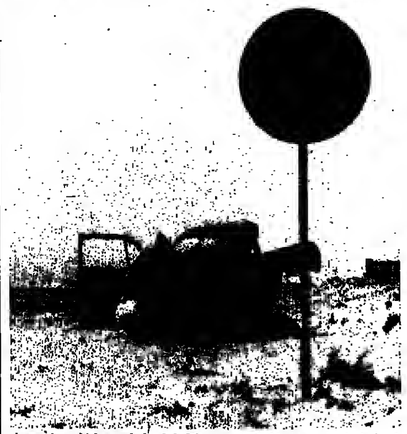
He became used to a high standard of living with regular meals at the local Hilton, a whole New Zealand lamb in the deep freeze when that journey seemed too far and a social life based on a beach club. He worked for the Ministry of Planning, which at that time was the only OS site in Kuwait. DOS/VS predominates.

He earned approximately £15,000 a year, including £2,000 overtime but, he says, did not save as much as he expected.

For those thinking of going out there, Waters has several bits of advice. He thinks that, with the stronger pound, it is not as profitable as it was two years ago. But if you do go, you must be prepared to hustle from the beginning.

He advises people to fix up a flat and says that he had to live in a hotel for two months after arriving in Kuwait.

If possible, he reckons it is better to be paid in sterling or dollars but, he warns, watch out on deals. Finally, the service of a tax consultant could come in handy to make sure the income really is tax-free.



A warning which wasn't heeded. There are probably more wrecked cars in Kuwait than there are road signs. This picture is one from Mike Waters' album of sand swamped write-offs.

PUZZLER

ABOUT time we had another alphametic. Here's a nice one which "reads true", and has just one solution. Try your luck at identifying the figures involved. Turn to page 39 if baffled.

THIRTY
TWELVE
TWELVE
TWELVE
TWELVE+
NINETY

- Apologies: The main chess pieces in the April 9 column should, of course, have been Kings and not Queens as shown.

PROGRAMMERS PAGE — by Pamela Rowe

Down to the library to shop

"IM just off to the library – anything you want?"

"Yes, a packet of Daz, six eggs, and a couple of kippers please."

This may be quite a common conversation up in Gateshead, Tyne and Wear now, for in the past few months a scheme has been launched to help the disabled and elderly do their shopping at the local library. A terminal linked to a local supermarket has been installed there, and infirm shoppers, instead of taking on the hassle of the High Street, can now simply slip into the Gateshead public library with their orders for tea, sugar, and so on.

A shop assistant, who operates the computer, first locates the items in the catalogue of goods. Alongside each photograph is a magnetic strip, and the descriptive data is fed into the computer via a sensor wand. The order details are simultaneously displayed to the customer and recorded at the store. At the end of the shopping list an itemised bill is produced, the goods paid for, and delivery is on the same afternoon, to the door and free of charge.

This project is run jointly by Tesco and Gateshead Borough Council. Director of its social services, Graham Lythe, described how a survey by Newcastle University had sparked the whole thing off. "Because of the increasing number of elderly people in the community, we have to look at new ways of helping them. The difficulties they have in getting to the large stores with the most competitive prices, were often expressed – it was time the computer came to their aid."

"We're highly delighted with it," said Jean Robinson, warden of an old people's home, who brings multiple orders from her charges. "They can't get out and they can't always be asking somebody to carry things from the town. It is also much cheaper, and keeps them in contact with the world outside."

Most of the other users echo this. Seventy-five-year-old Florence Francis can't get over the door-to-door delivery service which she says, cuts out all that waiting and carrying, and ensures there's always something in the house to eat. Orders can also be phoned in by the housebound or given to someone else to relay.

But apart from the undeniable appreciation, how commercially viable is the scheme? Who bears the costs of delivery, and what does Tesco stand to gain?

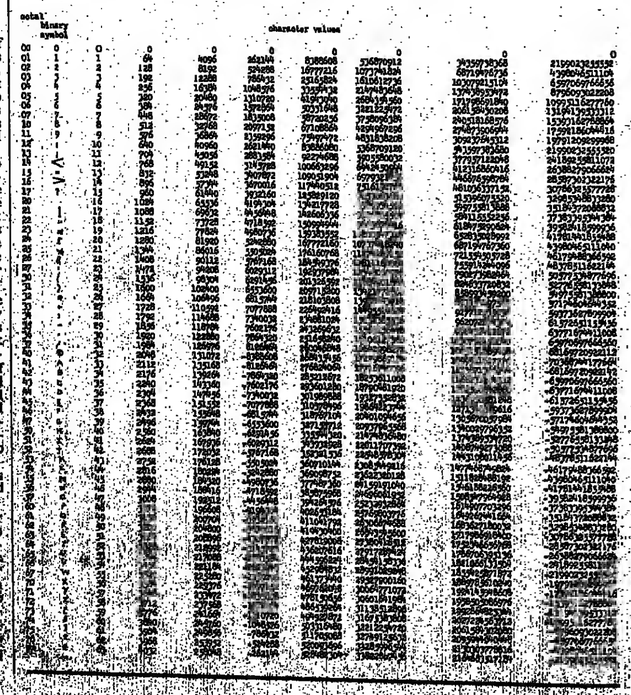
Bill Wright, general manager of the Gateshead branch, explained that the extra computing and transport expenses were included in store costs, but that the increased business should almost certainly bring in more profit, to make it a viable proposition.

"It's working," he said. "It has survived for some months and we're improving."

Graham Lythe added the wider social viewpoint. "The project is not just a question of using a computer in the community for the ordering of food. There are other possibilities, such as information services – telling people where the duty chemist is at the weekend."

"I'll use it as long as it's here," said Florence, who knows a good thing when she sees one.

The Computer Weekly Table of Decal Equivalents for Binary Numbers



Aid to fast checking

WE can all do with as many programming aids as possible. Besides such basics as nice sharp pencils, initialised rubbers, or erasable ball points, there are esoteric items like error codes, file maps, and this little table of binary/decal numbers, printed below.

It was devised in a programming department I worked in, and we all came to regard it as one of the most useful bits of paper there – the other being the holiday form. It can be used wherever information is held in binary which needs to be interpreted and checked.

A file print containing data to be manipulated by your program has to be converted to decal equivalents before and after testing the program. Similarly, any calculations carried out must often be checked by the program printout, in decal, against the stored data, in binary. Using the table, any interpretation is a simple matter.

The eight columns of the layout correspond with the binary format 0000 0000. Having traced the particular binary symbol in the symbol column, it is cross-referenced to the position it holds in the row, so that the least significant digit, held furthest right in the binary format, becomes the lowest decal equivalent. Easier with a few examples:

Binary	Decal Value becomes
0000 0004	16384
0000 0400	960
0000 0020	32

Intermediate decals are made by adding together binary columns.

0000 00	21667
0000 05	G

If you have any pet PAs you'd like to share with the world send them in. I'll publish those passed as fit, clean and decent.

PHILIPS

Simply years ahead

Just press for greater business efficiency.

Whatever your business you'll find Philips can help to dramatically increase your office efficiency.

For we've a wide range of electronic office equipment which saves time and cuts costs.

WORD PROCESSORS TO SPEED UP PAPERWORK.

Our latest word processor, the P5003, can originate, edit, revise, alter in format, and reproduce letters and documents very easily and quickly.

Then, once they're stored on the disk memory, up to 16 further instructions can be keyed in and automatically incorporated when you come to print.

It also enables the operator to perform one task, for instance preparing a report, while it does another, such as receiving data over the phone.

MICRO-COMPUTERS TO SIMPLIFY ADMINISTRATION.

Many of the above features apply to the P2000, a micro computer that can rapidly sort out many routine tasks.

Record keeping, stock control, book keeping, computation, report preparation, filing–all can be stored, instantly accessed and updated.

DICTATION MACHINES TO CUT DICTATION TIME.

Our sophisticated desk top and pocket dictation machines enable your secretary to be doing other tasks while you're dictating.

Then we've made transcribing easier too.

Our desk top machines have a visual device that indicates where a letter begins and ends, or where you want to make amendments.

So you can record instructions telling your secretary which part of the tape you'd like typed first, and how it is to be done.

Philips are one of the largest suppliers of electronic office equipment in the UK, and with our nationwide sales and service network we can provide back-up wherever you need it.

Our research programme spends £1m a day, ensuring we are in the forefront of this technology.

Philips Business Equipment is just one of the divisions of Philips Business Systems—leaders in Voice, Data and Text Systems.

To: Pat McDonald, Philips Business Equipment, 8 Arundel Street, London WC2 R3DT. Tel: 01-836 4360.

Please send more information on the P5003 ☐ P2000 ☐ Dictation systems ☐

Name

Company

Address

هكذا منه لأصل

Philips Business Systems

Help at the touch of a button.

CW/22/1

DATA ANALYSIS

The pieces of the jigsaw fit to make a complete picture

Section II – Part 7 of our series describing a system design methodology

by Rosemary Rock-Evans

THIS series of articles on data analysis has briefly described the methodology CACI uses to design databases and the systems which use them.

Each of the articles has described a particular aspect of the methodology – entity modelling, functional decomposition and so on.

In this article, the last of the series, we will fit all the pieces in the jigsaw together to make a complete picture of the stages of a project.

In Figure 1 a Function Hierarchy has been drawn to show the six functions or stages in the life cycle of a system.

- Strategy
- Analysis
- Design
- Construction
- Transition
- Production

In figures 2, 3 and 4 the first three functions have been further decomposed into their sub-functions. Some of the functions shown in the function hierarchies have not been discussed in these articles – cluster analysis, decision analysis, benefit analysis and so on.

Many of the functions will be recognisable, however: functions such as functional decomposition, entity modelling, data flow diagrams, access path analysis and entity life cycles. All the methods and techniques described in these articles therefore fit into a complete methodology for systems design.

The function hierarchies and this series of articles should emphasise one very important point – that analysis and database design is a subject which requires a sound methodology, considerable skill and much more than just superficial training.

Buying a DBMS is a little like buying a car. One is told that a car can offer enormous advantages. It allows you to go faster than before, it is more flexible and more efficient. It is more expensive than walking, but in the end the benefits outweigh the losses.

Some people buy DBMSs just for their file handling capability, but this is like buying a car to go up and down the drive. The real advantages of a DBMS are in its flexibility when that user environment changes and in its ability to obtain information about that environment quickly and efficiently.

No person would ever consider buying a car without having driving lessons, but many people buy DBMSs without having had one lesson on analysing and designing for databases.

It is no use thinking the manufacturer can provide the right training; manufacturers of cars do not sell driving lessons, they are not in that business, neither are manufacturers or vendors of DBMSs.

Data analysis has such a wide application that it seems inappropriate to label it as a technique for analysing and designing databases. It has, however, been used for this purpose more than any other by CACI for their clients and the firms they have taught to use it.

The techniques of entity modelling, functional decomposition and so on, because they analyse the data and the functions of a business, are not implementation dependent and are therefore equally applicable to work study, organisation and methods studies, reorganisation and policy studies.

Data analysis is so fundamental to the understanding of "systems" that it has an enormously wide range of uses. Wherever the analysis of business, organisations or institutions is required, for whatever purpose, data analysis could be and has in many cases been used.

This series of articles has provided a course of introductory "driving lessons" which have explained the basics.

All inquiries should be addressed to the CACI London office (Tel: 01-405 8233) at 289 High Holborn, London, WC1.

Data Analysis methodology developed at CACI by Tim ...

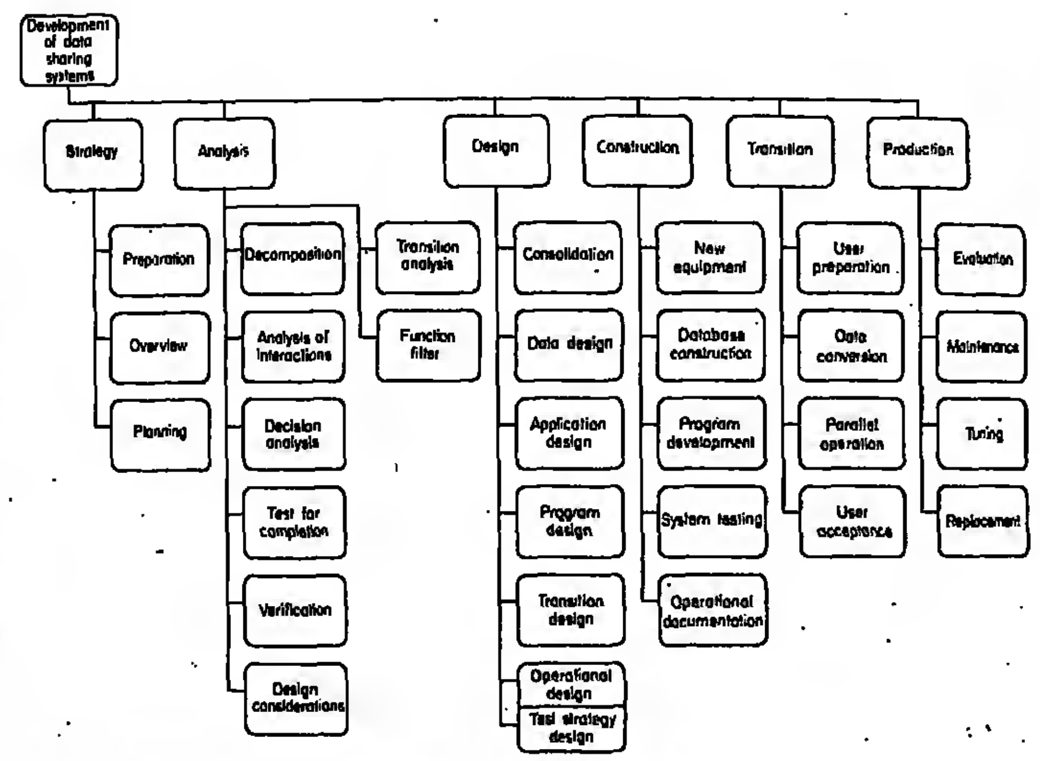


Figure 1. Function hierarchy showing the six stages in the life cycle of a system.

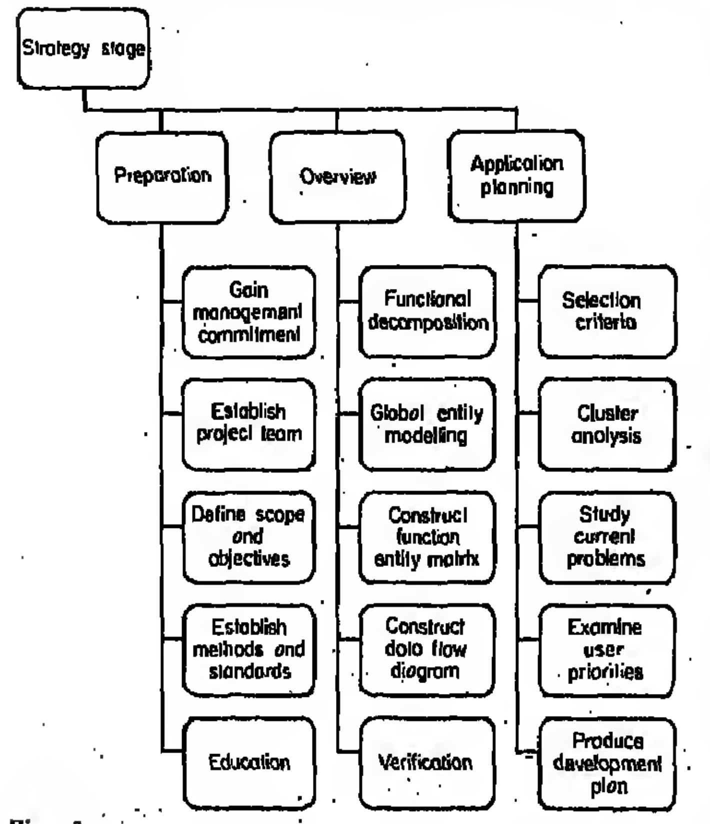


Figure 2.

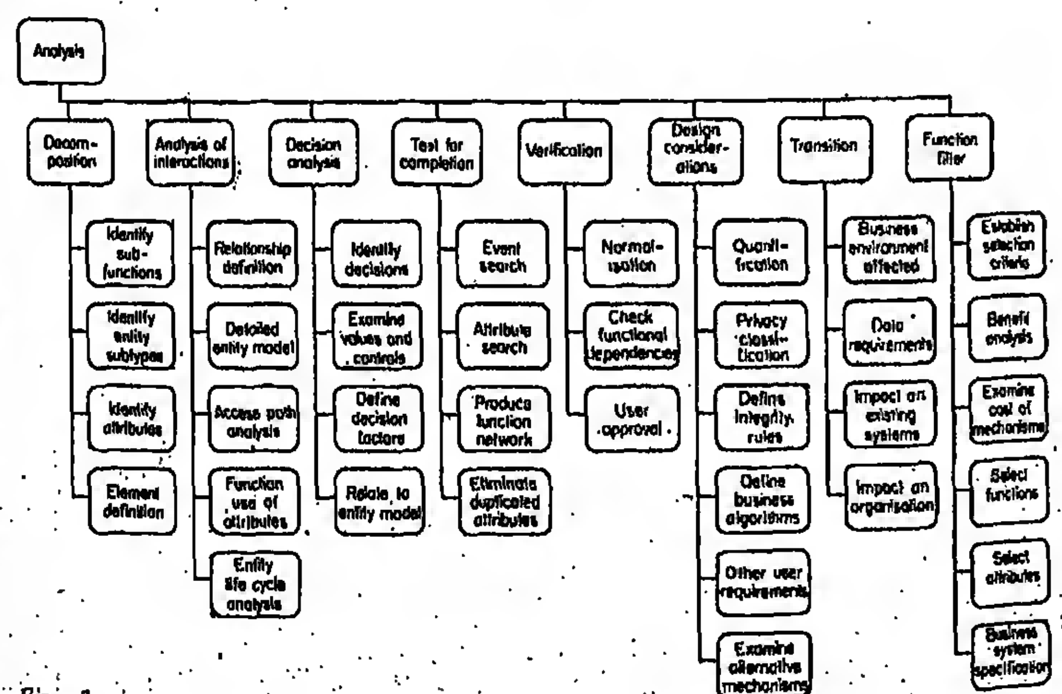


Figure 3.

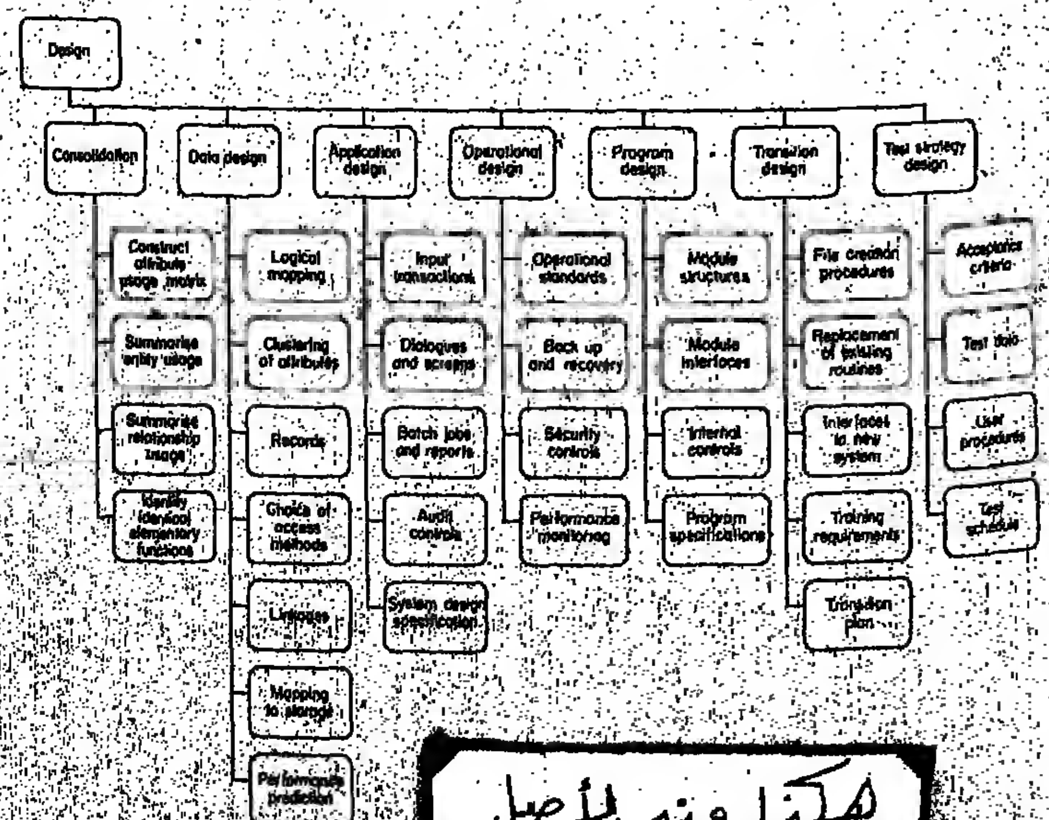


Figure 4.

هكذا في الأصل

WORD PROCESSING

SYATEXT is a fully interactive Word Processor that runs on PDP-11 computers (under the RSX-11 Operating System). It provides:
- a comprehensive command/function list
- single user or shared logic operation
- support for most commonly used terminals
- several levels of sophistication

Ask for a demonstration and compare SYATEXT with the other packages available.

SYADON are specialists in RSX-11 systems

For more details, contact BRIAN ROBERTS on (0734) 734493 or write to

SYADON LTD, Birchwood House, Heath Ride, Wokingham Berks, RG11 3QJ

The lowest prices in Britain?

Check our prices for

LA34 ... VT100
LA120 TALLY 1612
HAZELTINE VDU's

- OFF THE SHELF DELIVERY
- NATIONWIDE SERVICE

MCS

PEOPLE

Industry man is named professor

A SENIOR IBM professional who holds no first degree has been appointed Professor of Computer Science at the University of Manchester. Cliff Jones, who is a Fellow of the British Computer Society, went straight into industry from grammar school. His first job was with Leo Computers.

He went on to work for the Ilford Photographic Company, Esso Petroleum and the Ford Motor Company, where he was involved in the writing of programs concerned with data processing and operations research.

Since 1965, he has worked for IBM in the UK, Austria and Belgium. At first he developed testing methods for software, which led to an interest in techniques of specifying and designing large software systems by the use of formal methods. He is the author of a recently published book, Software Development: A Rigorous Approach, which describes the method. He is also co-author of two books on programming languages and their formal definition.

Jones has designed and taught courses at the IBM European Systems Research Institute in Belgium and is currently on leave of absence from IBM, working with the Programming Research Group at Oxford, where he is completing his DPhil.

ALL 600 of CMG Computer Management Group's employees received a miniature bottle of whisky for winning the Sunday Times J&B Rare Enterprising Britain Award, presented by distiller J&B Rare, Justerini and Brooks. The prize was originally to have been a case of 12 bottles of whisky to be presented to the directors of the winning company, but CMG decided that this was not in keeping with its democratic staff policies – 600 into 12 doesn't go. The presentation lunch was attended by one director, one founder, and pictured above chairman Bryan Mills, Linda Hennessy (customer accounts supervisor), Alan Vlieger (consultant, who was flown in from Holland for the lunch) and J&B Rare's UK manager Adrian Beaty.

Mitel funds telecoms chair at Chelmer

PROFESSOR Lew Schnurr has been appointed to the sponsored Mitel Chair of Telecommunication Systems at Chelmer Essex Institute of Higher Education. This is the first chair to be offered in public sector higher education in the UK, and is sponsored by telecommunications equipment company Mitel Telecom.

Prof Schnurr has been with Chelmer since 1965, when he took up an academic post there. He has been involved in degree-level teaching, responsible for educational policy in the telecommunications and electronic fields within the Faculty of Technology.

Since 1968, he has been involved in research into basic techniques of telecommunications and optimal systems, involving computer control and processing. He has a number of patents in the disciplines of signal processing and data transmission. He was appointed Reader in Telecommunications, Faculty of Technology in 1979 and research projects were centred around telecommunications and radio telephone.

In 1964 he was one of the four executive staff to set up a new division of STC in the UK and spent 18 months as chief engineer of the division.

■ Carol Demmer, sales executive for the past three years with Wilcox Computers, has been promoted to sales manager.

■ Peter Nelson, previously sales director of Data 100 Systems, has been promoted to general manager at the company.

■ Dave Chapman has joined Sigma Electronic Systems as sales executive. He was previously with the sales and support team at Perkin-Elmer.

■ Alan Day has joined Monotype Communications as programmer analyst. He was formerly a programmer with KPG.

■ Mike Tweedie and Kathy Sinclair have joined Data Logic's word processing and terminals division. Tweedie, former sales executive with Philips Data Systems joins as sales executive. Sinclair held sales and support positions with IBM, ICL, CMC and Wordplex and joins Data Logic as an accounts manager.

■ John Hall has been appointed an associate director at LMBS. He has been with the company since 1977, serving most recently as manager of the company's training division.

■ Harry Hughes, formerly a senior design engineer with Systems Productions, has joined Monolithic Memories as senior applications engineer.

■ Bob Male, formerly founder and managing director of Blackwood Associates, has joined Safe Computing as manager of IBM projects and contracts.

■ Neil Davenport has been appointed managing director of Gray Research. He joins the company from ICL where he worked for 11 years, serving most recently as a regional manager.

■ Mike Harrison has been appointed manager of international operations at Safe Computing's mini-micro systems division. He was formerly manager of Safe's Wokingham branch. Ken Jackson is general manager of the mini-micro division. He formerly held the same position in the smaller manufacturing systems division, now absorbed into the expanded organisation.

■ John Butler has been appointed executive vice-president, worldwide marketing and services at Sperry Univac. He was previously vice-president and general manager of the Americas national operations division.

■ Tony Applatoo, formerly a sales manager, has been appointed to the newly created position of customer services control manager at Baric.

DIARY

APRIL 29

Visit to Roneo Vickers business forms plant. IDPM Sheffield branch. Apply by April 10 to J. Shaw on Leeds 523388, or R. Child on Sheffield 750011.

Experience with new database products. BCS Database Users Group. Room G6, New Engineering Block, University College, London WC1. 2.00.

Visit to AMF-Legg Computer Centre, Andover. BCS Hampshire Branch. Names in advance to Martyn Must on Salisbury 20323. 7.00.

APRIL 30

Visit to Cold Norton Farm, Stone Animal Breeding Research Organisation. BCS North Staffs branch. 7.30.

The Cashless Society. BCS South Essex branch. West Cliff Hotel, Westcliff-on-Sea. 7.45.

Closing date for Computing Competition. BCS South Yorkshire branch. Details from P. J. Winnall, 376 Carterknowle Road, Sheffield 11, tel: Sheffield 734392.

MAY 5

Branch AGM/social evening. IDPM Scottish branch. Station Hotel, Stirling.

Personal Computing and its Impact on Data Processing. IDPM Birmingham branch. Dudley College of Technology, The Broadway, Dudley. 7.30.

MAY 6

Don't Shoot The Auditor – He's Doing His Beat. IDPM Sussex branch, Stanford Arms, Preston Circus, Brighton. 7.00.

MAY 20

Has the Operations Team a Future? Branch AGM. IDPM Central London branch. Speaker is Computer Weekly's Paul Fialter. Pearl and Dean Studio, 15 Broadwick Street, London W1. 6.00.

MAY 21

Where are we with Databases – NCC Today and Tomorrow? Branch AGM. IDPM Essex branch. County Hotel, Chelmsford. 8.00.

MAY 26

Data as a Company Resource – Is This a Practical Idea and How do we Achieve it? Branch AGM. IDPM West London to Oxford branch. Bull Hotel, Gerrards Cross, Bucks. 7.30.

MAY 27

Spring Event. IDPM Sheffield branch. Grosvenor House, Sheffield. Contact J. Reedman on Sheffield 387014. 7.00.

JUNE 17

Database design. IDPM Central London branch. Pearl and Dean Studio, 15 Broadwick Street, London W1. 6.00.

COURSES

■ THE only course on CP/M to be held in the UK is being run by the Computer Training and Education Centre, Ctec. Scheduled for July 20 and 21, the course will be held at Ctec's training centre in Clerkenwell Road, London. The course offers a practical working environment and aims to provide theoretical background along with demonstrations on machines, and practical sessions. It is assumed that some people attending the course may have had no previous access to a computer. The course costs £172.50 including VAT. Details from Ctec, 102-108 Clerkenwell Road, London EC1. Tel: 01-251 4010.

■ THE Chris Evans Memorial Lecture will be presented on May 29 at the London Regional Management Centre. Speaker will be Peter Large of the Guardian, who will take as his theme The Times, They are a-changin'. He will present his views on the impact of the micro on the print industry. The lecture forms part of a course on the effect of the electronic revolution and the implications for education, medicine, finance and social life. The cost of the course is £60 for academics and £80 for others. The memorial lecture, however, is free. Applications should be made to the London Regional Management Centre, 311 Regent Street, London W1R 8AL.

■ The designer is usually aware of the information processing limits of his machine, but perhaps not so aware of the limitations of the user. In September, the University of York will hold a five-day course, The User Interface, for people concerned with the hardware and software of man-machine interfaces: Terminals, dialogues, control layouts and recognition systems. The limitations of the user are discussed under the headings Visual Perception, Speech Perception, Language by Eye, Human Memory and Problem Solving Behaviour. Details from Andrew Monk, Dept of Psychology, The University, Heslington, York YO1 5DD. Tel: (0904) 59861 ext 5933.

Do not adjust your set

...the faultlies with the topography. If your TV reception is not all that it might be our May issue will be of special interest. We're featuring an active TV deflector to allow the reception of television signals in areas where the surrounding country prevents the normal transmitted signal being used. We also have a design for a digital capacitance meter measuring values between 1pF and 1000 microfarads plus John Linsley Hood on a new way of using the Wien bridge to design very low-distortion oscillators, giving total harmonic distortion down to 0.001 percent.

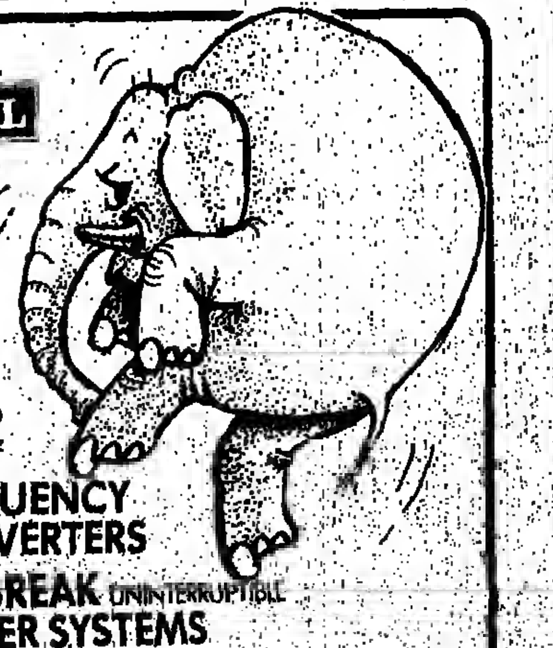
May issue out now. 60p.

wireless world

Electronics · Television · Radio · Audio

MPL

Computer Power Systems



SILENCED 50Hz 60Hz & 400Hz

■ FREQUENCY CONVERTERS
■ NO-BREAK UNINTERRUPTIBLE POWER SYSTEMS
■ MAINS NETWORK STABILIZERS

FOR COMPUTER ROOM INSTALLATION WITH COMPUTERS AND OTHER CRITICAL LOAD EQUIPMENT REQUIRING HIGH STABILITY POWER

MPL COMPUTER POWER SYSTEMS

MANAGING YOUR BUSINESS GUIDES

£5.00

- Tax and VAT
- Employees, Health and Safety
- Selling, Importing and Exporting
- Starting a Healthy Business

Tax and VAT £5.00
Employees, Health and Safety £5.00
Selling, Importing and Exporting £5.00
Starting a Healthy Business £5.00

Robert Street considers an alternative solution to the limitations of modern conventional computers

How parallel systems can break through the speed barrier

SUPPOSING somebody came up with a solution to a problem you didn't know existed? Would this be arrogant, indicative of praiseworthy community involvement, plain stupid or symptomatic of bad marketing? Alternatively, could it be anticipating a trend, and therefore good marketing maybe?

The problem is summarised in Figure 1. This shows that, roughly speaking, the "power" and thus speed of computers has increased by a multiple of five every five years (giving the ACE computer a figure of 1 in 1950), except that from 1970 onwards this has tended increasingly to be no longer true and is certainly very far from the case today.

This is probably inevitable, since with most things, animate and inanimate, there comes a time when the increase in performance is by small amounts and not by large multiples. So what? There must be a limit to the speed of things, the speed of light being the obvious barrier. So why should it matter if speed doesn't increase every so often?

This can lead to considerable philosophical and possibly psychological controversy and is probably best left alone.

However, there are distinct advantages in certain fields in going for an increase in speed. On of those fields is in operations where vast amounts of data have to be processed and where an improvement of even 1% in efficiency could save $100,000,000 or so.

This is the realm of reservoir engineering in oil exploration where, today, even very fast computers can chug away for days on end to produce results and assessments.

> **The DAP is wide open to misunderstanding since, instead of coming out of the corner fighting with both hands, it comes out with two hands at the front and two hands at the back, doubtless guaranteeing to floor any opposition in the right circumstances**

Comparable fields where vast amounts of information are involved include structural engineering and image processing, together with weather forecasting and other areas where the solution of partial differential equations is demanded.

There could eventually also be other fields today in the realms of science fiction, such as the simulation of the human brain, where similar vast amounts of data have to be handled. So improvement in speed is a problem, albeit in areas remote from many of us. It is these applications to which most large computer technology has been oriented over the past 20 years or so.

The improvement of speed of computers by whole multiples is now, so it seems, a thing of the past, so that alternative approaches, if such exist, have to be considered. Do they exist? Supposing that instead of carrying out sequential operations as has been the case in the classic von Neumann computer, we try looking at a problem from a different angle and seeing how much can be processed simultaneously without affecting the validity of the final result.

Take a simple example – take the solution to a quadratic equation. A quadratic equation is of the form:

$$ax^2+bx+c=0$$

The solution of this is:

$$x=\frac{-b\pm\sqrt{b^2-4ac}}{2a}$$

This is straightforward enough, but just how much of it can we calculate simultaneously without affecting the result? Clearly b^2 and 4ac together with 2a on the bottom can be calculated at the same time with advantage. Thus a computer

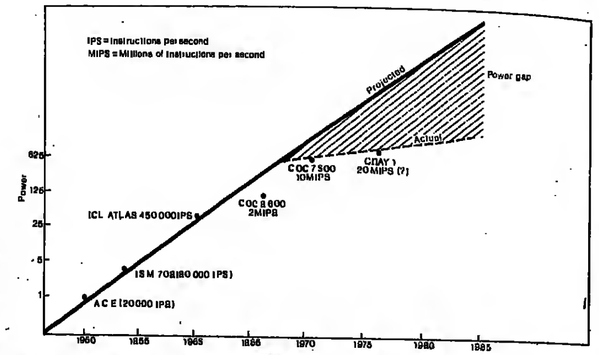


Figure 1: The limitations of computer power.

able to calculate these items simultaneously will be faster than one with similar speed which works sequentially – on this particular problem.

If this concept could be extended to other forms of problems so that as much as possible in their solution can be calculated concurrently, then the savings in time, at least in theory, would be immense. In particular, many problems in matrix algebra, in partial differential equation solution and in the areas referred to above could fall into this category.

What are the snags – as snags there surely must be?

In the first place, one difficulty is that problems will have to be "re-thought" so that parallelism can be brought to bear. Another associated difficulty arises in the use of conventional computer languages, such as Fortran. Instead of referring to single variables, one will have to refer to groups of variables; instead of referring to a single operation, one will be using multiple operations expressed in the form of a single operation.

To see how these are dealt with by one method used in practice – and the snags that can arise there – it is interesting to look at vector processing, such as that used on the Cray 1, for example. On this machine, eight registers hold 64 variables each. These are called vector arithmetic units and there are three of them performing addition, multiplication and reciprocation of floating point variables.

To give an example, a single instruction of the type V1+V2=V3 will cause the addition, element by element, of the successive items in vector register V1 to the successive items in vector register V2 with the results being put successively into vector register V3. The time this takes on the Cray 1 after an initial set up time of 100 nanoseconds is that the results will appear in V3 at 12.5 nanosecond intervals. These vector units can operate concurrently, so that with suitable overlapping it is possible to achieve 240×10^6 floating point operations per second.

Even with this relatively straightforward operation or series of operations, the problem and its programming clearly had to be recast to some extent from its original sequential solution. There is also the question of whether this recasting and rethinking is worthwhile. How much time does it really save? Isn't it likely that a very large proportion of the time will be spent moving the data around, testing it, indexing it and so on? And supposing we want to include a test at a certain point in the series of operations? It is just not on – at least in the middle of, with Fortran loops on the Cray system.

This series of questions, therefore, highlights the problems: what is the real value of the extra speed and how can a computer suffering it be put to use?

One solution lies with the ubiquitous microprocessor. Going back to our simple quadratic equation solution, namely that:

$$x=\frac{-b\pm\sqrt{b^2-4ac}}{2a}$$

if we had three microprocessors, one which calculated b^2, another which calculated 4ac and a third which calculated 2a, then a fourth microprocessor could do the necessary arithmetic and tests and bring in the other elements for the final solution.

The other approach to parallelism is that the same four microprocessors could each solve a complete equation, hence performing four parallel solutions in the time of one.

If this concept is extended to not just three or four microprocessors but a whole array of them, we have the ICL Distributed Array Processor (DAP). This is a misnomer in many ways and should really be called an Array Multi-Processor.

> **The improvement of speed of computer by whole multiples is now a thing of the past, so that alternative approaches, if such exist, have to be considered**

This multiple microprocessor solution offers true parallel processing as opposed to the apparently parallel processing of the conventional array processor (AP) which is normally an add-on to minicomputers and now even microcomputers.

The array in the case of the ICL Distributed Array Processor (DAP) consists currently of a 64 × 64 set of microprocessors, but will be available with 128 × 128 processors at some rather nebulous time in the future. Each of these processors has its own storage capacity of 4096 bits, a cycle time of about 200 nanoseconds and the internal data transfer rate is 20,000 megabits/second. In other words, it is no mean performer. The way this system works is that a master controller issues a stream of instructions, but at any given time each processor is obeying precisely the same instruction but not necessarily operating on identical information. Thus the benchmark test, beloved of so many organisations, is just not possible in these circumstances.

To underline this, if one takes as an example a matrix multiplication on a conventional sequential processor, the time to carry this out will be a figure which is proportional to N^3, so that for 25 × 25 matrices, to take a trivial instance, the time will correspond to some multiple of 25^3. But this time using the DAP is not so proportioned, since 25^2 operations will take place at the same time. Thus the actual time consumed in carrying out the complete matrix multiplication on the DAP would be some multiple of 25 rather than 25^3.

This means that the DAP is wide open to misunderstanding since, instead of coming out of the corner fighting with both hands, it comes out with two hands at the front and two hands at the back, doubtless guaranteeing to floor any opposition in the right circumstances.

Rethinking problems and programming is a necessary concomitant of parallelism and such rethinking is also true to some less extent for vector processors in general. However, on ICL's DAP, the problem is not as bad as one might think since one can always carry out conventional Fortran coding and then easily translate it into the version of Fortran used on the DAP. (This, invented by ICL staff, is called DAP-Fortran.) A number of examples are given in the booklet Software and Algorithms for the Distributed Array Processors, obtainable from DAP Marketing Unit, ICL, 322 Euston Road, London, NW1 3BD.

ICL has reconstructed programs to run on the DAP for specific users to help them evaluate DAP for their particular applications.

One further major factor in handling either vector or true parallel processors is how to deal with data manipulation. How important this is can be seen from studies which have been carried out by ICL which claim that only 25% of the overall processing on a conventional machine involves actually using the high speed arithmetic qualities of the system, whereas 75% of the processing is moving data around and testing it. This, of course, depends on the problem but it is self-evident that the amount of data pushed around in problems associated with areas like reservoir and structural engineering, for example, is very great. Another key area affecting the sheer speed of the overall system can be seen by looking at the way input/output is handled by APs.

The way that most, or even all, array processors work at the moment is that there is some sort of interface between the AP and the host system. This means that all the inefficiencies of that host system have to be taken into account when assessing the AP. Most of the problem in this area lies with the host operating system, with the result that each host computer plus its array processor has to be looked at individually in the light of the range of problems which are to be run.

With ICL's DAP, the situation is somewhat different since an ICL 29XX (where XX is 60 or above) acts as the host processor (see Fig. 2) with ICL's DAP being treated as a storage module of 2 megabytes by its 29XX host.

The merits of this arrangement are that the 29XX and the DAP should be well integrated, whereas an array processor which can be fitted to a host of a different maker from itself does not have this advantage.

This ICL duo (the ICL 29XX and the DAP) has already been sold to part of London University (Queen Mary College) in a 64 × 64 array form, and the British National Oil Corp has taken delivery of a second similar system.

But, to answer the main question "Is parallel processing an answer to the speed limitations of modern conventional (von Neumann) computers?" the answer could be a very definite Yes; providing the advantages and disadvantages are clearly laid out, so that developments can be concentrated on areas where parallelism seems to be most effective.

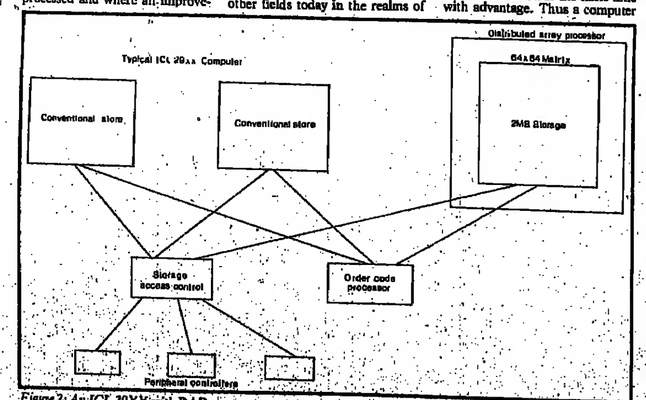


Figure 2: An ICL 29XX with DAP.

If you find an ad unacceptable, don't turn the page: turn to us.

The Advertising Standards Authority.
If an advertisement is wrong, we're here to put it right.
ASA Ltd, Brook House, Torrington Place, London WC1E 7HN.

Dr Israel Berkovitch examines the present uses and future potential applications for robotics in industry

Robots could help keep UK competitive in world markets

THE MOST striking difference between robots and earlier hard automated handling or other electro-mechanical devices is that robots can be computer-controlled and readily reprogrammable, giving them great flexibility in application.

Yet their main area of use so far has been in the car industry where there are long runs of identical operations. In these uses, it must have been their other virtues that dominated the choice and led to their adoption.

These virtues are consistency, with no stops or breaks, immunity to unpleasant environmental conditions, and relatively short lead time in adapting a standard machine to local job requirements, since it is supplied as a fully-developed piece of machinery.

Nevertheless, it is the capacity for ready reprogramming because of the microprocessor control that must be the key to future growth (some talk boldly of unlimited potential) of robots, for two reasons.

They are not likely to become obsolescent: when a current job has finished, the robot can be repositioned, re-tooled and – most important – re-programmed to carry out a new operation unlike a machine of fixed purpose.

Most manufacturing is of relatively limited batch sizes and therefore ideally suited to the flexibility of robots.

To help managers to understand the potential for industrial applications, PIRA – the research association for the paper and board, printing and packaging industries – recently ran a seminar entitled

> **The world robot comes from the Czech word robotit meaning "to labour". It was used in a play by Karel Capek (pronounced Chapek) called RUR (Rossum's Universal Robots) in 1920.**

A Manager's Guide to Robotics – Potential Industrial Applications – introduced by Dr Rooks of the British Robot Association at Leatherhead, Surrey.

The first and obvious question is "what is a robot?" To this, Dr Rooks' reply is that an industrial robot is a programmable arm or arms with multi-degrees (normally three) of freedom, with a wrist also having three degrees of freedom and some form of tooling or other "end-effector".

Most are hydraulically driven but DC electric and pneumatic drives are also used.

They are controlled by plug boards or programmable controllers for simpler machine loading and unloading but have full Computerised Numerical Control (CNC) for arc welding or conveyor tracking.

When CNC was introduced in 1975, it was a major advance since editing and program branching became available.

There are estimated to be about 14,000 robots in use in the world today – half of them in Japan, the rest equally divided between the US and Europe.

Within Europe, Sweden and West Germany are the leading users but the US is now increasing its employment of these machines and numbers are reckoned to be up to 300 with main usages being handling, processing and assembly.

Handling includes servicing machine tools, die casting or presses, transferring products to conveyors or pallets. The robot is equipped with grippers, vacuum pads or magnets to hold the parts and is controlled by relatively simple control systems.

Processing includes such operations as welding, brazing, laying glass fibre, spraying paint, grinding, deburring or drilling. Any special jig required is more likely to be needed to hold the part being processed.

Assembly is mainly picking and placing parts. This is at an early stage; it calls for great accuracy and for feedback from sensors.

A major area of research into methods of improving the usage is the Robot Advisory Service of the Production Engineering Research Association with the only slightly differential acronym PERA. By means of interactive computer-graphics terminal, PERA analyses industrial workplace interactions.

Among other studies, this equipment and methodology are applied for simulating robots in potential industrial operations.

D. Gatehouse discussed how this service can help in designing robots, in choosing from existing ones and in assessing performance.

The interactive graphics are designed to enable workplace operations to be visualised, enable workplaces to be "assembled" and "laid out" and allow practical development of typical sequences of working tasks.

The job is planned and then "run" in an animated display. It is easy to see any interference or fouling of moving objects by viewing the sequence from a number of different positions.

The modelling system is based on the SAMMIE[1] Computer Aided Design software originally developed for investigating ergonomic design and including a model of the human operator.

Gatehouse described how the model is built, defined by the shape of the components, their locations and logical relationships, combining components of simple convex polyhedra to form arbitrarily complex solids.

Kinematic properties of the robot are reflected by a Characteristic Equation (C E) which, in matrix form, is

$$P=T_1T_2T_3T_4G$$

where P is the position vector of the Tool Centre Point in global co-ordinates T_1 etc are the transformation matrices and G is the grip vector.

To specify a task, a sequence is programmed in a series of Tool Centre Point (TCP) positions together with grip and release, types of movement and time delays.

It is then "executed" and the TCP moves from one point to the other through its trajectory maintaining the correct orientation of the workpiece. Velocity and acceleration are chosen to be a good approximation to those of a particular robot.

Figures 1, 2, 3, and 4 show simulation of automated workplaces. Fig 4 was an experimental layout to examine the working of a multi-robot installation.

This graphical approach has been found to be a powerful method for evaluating performance. Details of commercial robots are being stored on file, allowing realistic workplaces to be assembled quickly for study by this technique.

The Science Research Council (SRC) has concentrated on a programme intended to leapfrog the present generation of robotics devices so that British industry can take full advantage of intelligent robots.

These are seen as playing a crucial role in keeping British products competitive in world markets and the greatest challenge is taken to be that of assembly (see CW July 31 1980).

These future intelligent robots will form the central controlling component in Flexible Manufacturing Systems, making many different types of products to satisfy "a market of increasingly sophisticated customers".

Dr Peter Smith of the Rutherford and Appleton Laboratories described the emphasis as being on building sensors for vision and recognition.

These will demand associated ultra-high-speed computing techniques for extracting features in a few milliseconds from sensors capable of detecting any changes in tactile qualities or visual, infrared, ultrasonic, capacitative, inductive or others.

Software standards will be required since the complex assembly tasks will almost certainly call for indirect programming offline, in place of the simple teach-in procedure that is used to set up virtually all the robots now being used in industry.

Dr Smith added that the more the inherent flexibility of the robot is used, and robots increasingly undertake small-batch production, the more important it becomes to simplify the production of accurate programs by production engineers and foremen.

Partnerships have been set up already between the SRC and research groups in universities, polytechnics and individual firms. SRC seems to favour working with researchers interested in applications rather than building robots.

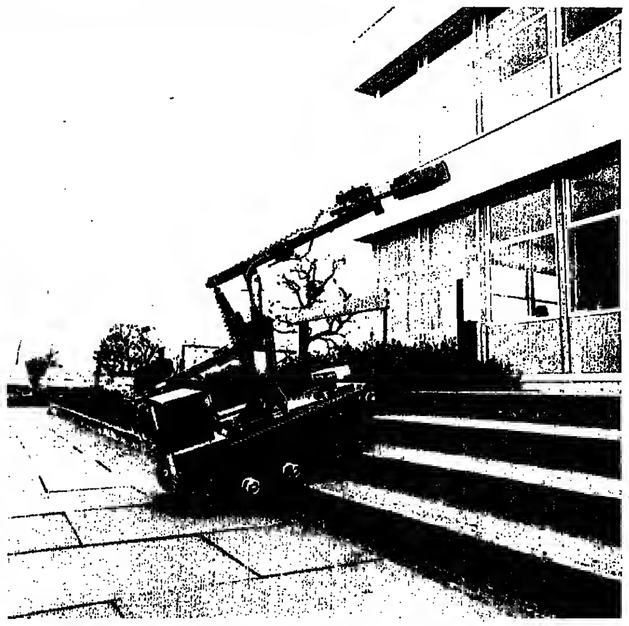
In its experience, those wishing to apply robotics, but finding themselves frustrated for lack of a key robots system, are often in a better position to propose a research topic that has the potential to leapfrog present techniques and thus meet the criterion of this research policy.

Applications are still being invited for grants under this scheme.

A surprising gap in the information presented was the lack of economic appraisals. Ultimately manufacturers will apply robots because they pay off and not because of technical ingenuity or on the grounds of broad social advantage.

Some of the advantages – such as those of working in conditions unpleasant to people – may be difficult to quantify. But ultimately potential users must ask, "what are the cost advantages?"

REFERENCE: Bonner, M. G. and Case K., "The development of SAMMIE for computer-aided workplace and work task design." 9th Congress International Ergonomics Association, Maryland, US, 1976.



Commander Bill, a mobile robot developed by the research group at Warwick University, demonstrates its skill in negotiating the Warwick Computer Centre steps.

Simulations of automated workplaces

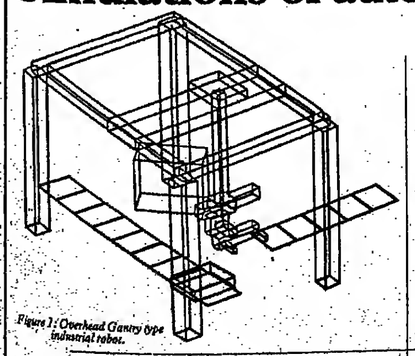


Figure 1: Overhead Gantry type industrial robot.

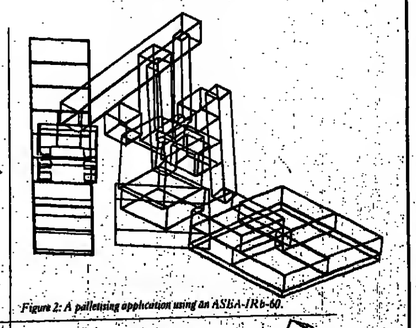


Figure 2: A palletising application using an ASEA-IRb-60.

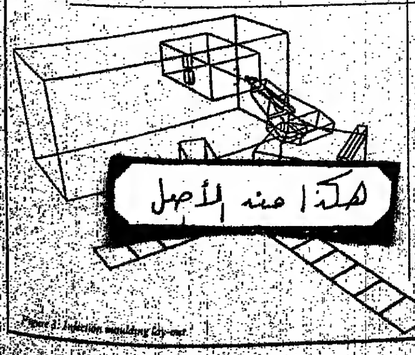


Figure 3: Injection moulding lay-out.

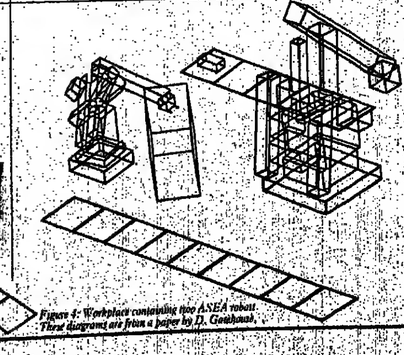


Figure 4: Workplace containing two ASEA robots. These diagrams are from a paper by D. Gatehouse.

PRODUCTS – 1

Intermediate terminal is easy on user

LEAR Siegler's IT Intermediate Terminal video display is now available in an ergonomic housing, says the company.

Designated the ADM32, it features a neutral, ergonomic housing, detachable keyboard for independent positioning of keyboard and display with an extended keyboard housing to provide a hand rest. The ADM32 has a 13-inch or 15-inch CRT with 10 degree screen angle, green screen and screen tilt options and a terminal height of 15.5 inches which enables the majority of operators to position their line of sight within 15 degrees of the terminal's central axis. The enclosure can accommodate an extra circuit board for added features and customisation.

The terminal has a small footprint which adds to operators' convenience when positioning the unit in restricted spaces, the company says.

The ADM32 maintains all the capabilities of the Lear Siegler ADM31 Intermediate Terminal.

Lear Siegler (CW), Orchard House, Connaught Road, Brookwood, Surrey GU24 0AT. Tel: Brookwood (048 67) 80666/7.

A student at South East London College undergoes WP training on a Bitsy.

Education package for colleges

AN educational package for colleges has been introduced by Adler and Imperial Information Systems. It comes with the purchase of a Bitsy word processor.

The package has been designed for colleges investing in word processors for their secretarial and clerical courses, to relieve them from hours of staff training.

Parent company Office and Electronic Machines says that some colleges using the new package have saved up to 200 hours in staff training time.

It includes an intensive three day course which equips college staff with all they need to know about the Bitsy and its associated software.

Office and Electronic Machines Limited (CW), 140 Borough High Street, London SE1. Tel: 01-407 3191.

'Streaming' tape drives from DG

TWO compact, low-cost tape drives designed for disc back-up storage are available from Data General.

The tape subsystems use "streaming" technology and 1600-bit per inch recording density. To facilitate use by office personnel they feature what is claimed to be easier reel mounting and a simpler tape loading path than vacuum-column tape drives. In addition, they offer full IBM/ANSI 0.5-inch tape file exchange capability.

The streaming tape drives are Model 6123 for MicroNova systems, and Model 6125 for Nova and Eclipse systems. As "streaming" drives, they achieve maximum performance when a stream of data permits continuous forward tape motion. This makes them suited to back-up applications, says the company.

The new tape drives are said to be lower in cost, have simpler packaging, use less power, and are quieter than conventional vacuum-column tape transports. They do this by eliminating the drive capstan and the vacuum system or tension arm with their associated long tape paths.

Model 6123 for MicroNova computers costs £4,303 and Model 6125 for Nova and Eclipse computers costs £4,434.

Data General (CW), Hounslow House, 724-734 London Road, Hounslow, Middx. Tel: 01-572 7455.

Disc gets military spec

A MILITARY specification version of the Model 750 Fast Access Disc Memory offering potential users a capacity up to 4.8 megabytes with an average access time of 8.3 milliseconds is available from Digital Development Corp. A high vibration package has been added to the options for the standard unit.

In common with the commercial Model 750, the unit is compact, occupying 9½ inches of rack space. It is built on a modular concept and is available in a variety of configurations.

The unit is fully compatible with many of the commercial and military processors such as Rolm, Norden and Sperry Univac. DDC claims that the small size, simplicity and compatibility will make the Model 750M series attractive within a variety of land and seaborne applications such as air defence systems, weapon control systems, ECM/ECCM systems, radar signal processing, and transportable and base communication systems.

DDC (CW), Frome Unit, Wade Road, Kingsland Industrial Estate, Basingstoke, Hampshire RG24 0PL. Tel: (0256) 53883.

Coupler holds angle

A 300 bit/second acoustic coupler, which holds the handset at the PTT recommended angle to ensure optimum performance of the telephone microphones, has been introduced by Bootstrap of Dublin. The AM-300 can be used with a portable terminal from any telephone to dial up time sharing services and central computer sites.

This modem was designed for the European market and has been approved by the West German PTT. It uses the call-originate frequencies specified in the CCITT V21 recommendation for 300 bit/second asynchronous full-duplex data communication. The acoustic interface complies with CCITT V15 and can hold most telephone handsets, including modern "square" types.

The AM-300 coupler has a standard RS232C data interface presented on a 25 pin D-type female connector. LED indicators on the front of the modem show the status of interface circuits 109 (Data Carrier Detect), 107 (Data Set Ready), 104 (Received Data) and 103 (Transmitted Data).

Another aid to the user is the local digital loopback (Test) which allows the modem to test the data interface and provides a local echo facility when the terminal is in communication with half-duplex computer systems. Depressing the Test button forces the modem to reflect all incoming data from the keyboard back to the terminal display or printer as well as sending the data over the telephone line.

Bootstrap Ltd (CW), 9 Georges Avenue, Blackrock, County Dublin, Ireland. Tel: Doblin 887892.

Power back-up lasts 2hrs

THE effects of a power failure can be critical where microcomputers are in use. Important records can be lost or damaged, and the after-effects of computer failure can lead to loss of production, or administrative headaches.

Temporary loss of power often goes unnoticed; as it has no effect on other equipment.

Capricorn Computer Systems has developed an emergency power back-up system, Microguard, which prevents this happening, it claims.

Housed in a compact unit, it uses a standard 12 volt car battery to produce up to 200 watts, enough to power a complete microcomputer system, including printer for up to two hours. Microguard reacts instantly to mains failure, says Capricorn.

The quartz controlled circuit keeps frequency within tight limits, and voltage is maintained to help prevent printer or VDU deselection.

Fast reaction to power loss and a stable power supply make Microguard suitable for most microcomputers. It costs £275 plus VAT.

Capricorn Computer Systems (CW), 24 Foregate Street, Worcester. Tel (0905) 21541.

A system for the scientist

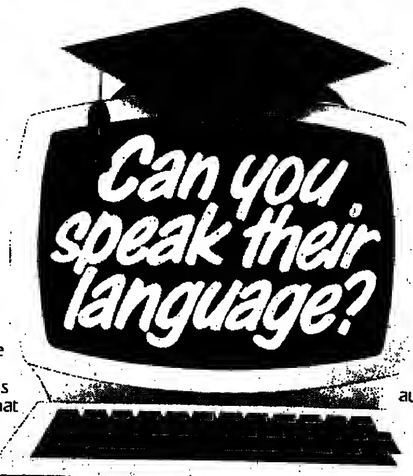
INCAA's computer system for scientists and professional engineers, called Shaman, is constructed with those microcomputer and interface Eurocards, says the company.

A professional control console allows complete control of computer and interface bus. The user can commence software development, satisfied that the hardware and control interfaces have been completely checked out, say the manufacturers.

Software tools include a real-multi-tasking executive allowing up to four unrelated tasks to share the interface facilities of a single computer system.

The text-editor allows programs to be listed, modified and annotated before Macro-Assembly or Basic compiling. Complete multi-level interrupt control allows all the interface cards to accept and respond to asynchronous real time events.

INCAA (CW), P.O. Box No 66, Cheltenham GL51 3BJ. Tel: (0242) 31831.



EDUCATIONAL COMPUTING is the new magazine for everybody who has ever wondered what the microcomputer revolution has meant to education. Here's your chance to find out everything about the use – and study – of computers and their peripherals in schools, colleges and universities.

Computer services have an obvious part to play in the educational process itself. As well as providing important opportunities for your students to learn many skills which could be vital to their futures, you will benefit personally by greater familiarity with the one subject that's undeniably changing everyone's life.

This unique magazine will offer penetrating investigations into the educational applications and implications of data processing systems; full details of available courses, examinations, and career options; and an authoritative range of reviews – of equipment, software, programs, and books currently on the market.

And our "Beginners' Guide" really does start right at the beginning, with advice on raising the finance for your hardware, and how to be sure you're choosing the right system for your needs.

Teachers and students alike will want to use EDUCATIONAL COMPUTING to keep them abreast of the latest technological developments. As one of the ECC family of top computer publications, you'd be right to expect a knowledgeable – and entirely unpartisan – editorial approach. This is a complex and challenging new field, where there is always something new to learn. So don't risk being left behind. Send the coupon today.

Please enter my subscripton for ten issues at the annual rate of £6.50. I enclose a cheque/PO.
Please charge my credit card (delete as applicable).

Name _____ Title _____
School/College/University _____
Address _____
_____
_____ Signature _____
Type of card _____ No _____

Send to: EDUCATIONAL COMPUTING, ECC Publications Ltd., 30/31 Islington Green, London N1 8BJ.

هكذا منه الأطهل

PRODUCTS – 2

Analyser detects faults in systems

THE increase in remote data processing systems has led to a need for software-oriented test and monitoring devices like the DA-10 Data Analyser introduced by W & G Instruments Ltd of Greenford.

DA-10 is designed for use on digital data communication systems at the electrical interfaces V24/V28 (X20, X21). The procedural interface X25 is claimed to be usable in packet-switched service.

Through its software, the DA-10 may be employed to monitor and trouble-shoot sophisticated systems, W & G Instruments claims.

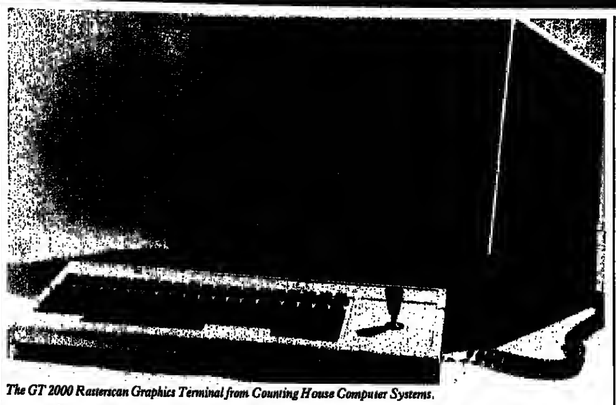
Despite the high demands and complicated tasks expected of a measuring instrument of this type, the DA-10 is said to be "user friendly". CRT screen and ergonomically arranged operator keys on the front panel should mean that the program parameters can be simply and swiftly adjusted.

The programs include monitor programs for trouble-shooting and for the viewing of byte and bit-oriented procedures, a 511/2048 bit test for ascertaining bit error rates on communication circuits, timing measurements to measure switching times at the V24/V28 interface, distortion measurements on asynchronous systems and simulations such as checking out data terminal equipment (DTE) in offline operation on the substitution of DTEs.

A cassette reader mechanism with control is available for extending the uses of the DA-10. With this it is possible to store data, program parameters and auxiliary programs. The cassette control card contains its own microprocessors with appropriate RAM and BPROM stores. Another option is the distortion measurement device which processes incoming data with its own microprocessor system.

The DA-10 has optional damage-resistant front and back covers and a transport case designed to protect the instrument against rough handling.

W & G Instruments (CW), Progress House, 412 Greenford Road, Greenford, Middx UB6 9AH. Tel: 01-575 5020.



The GT 2000 Rasterscan Graphics Terminal from Counting House Computer Systems.

Flexibility for graphics users

COUNTING House Computer Systems of Bury St. Edmunds has launched the GT 2000 high resolution rasterscan graphics terminal, said to offer the graphics user more flexibility and options at a lower entry price than other rasterscan terminals.

The GT 2000 is fully Tektronix software, compatible and offers high resolution of 1024 by 792 viewable points plus alpha scrolling capability, normally only available with conventional VDUs.

Alpha characters are displayed as 64 lines of 132 characters per line in four different character sizes, depending on the amount of data to be displayed on the screen.

It costs from £4,800.

Counting House Computer Systems Ltd (CW), Foraham House, Fornham, Bury St. Edmunds, Suffolk. Tel: 0284 68921.

IBM adds to 3274 range

IBM UK's data processing division has made available seven new models of the IBM 3274 range of terminal control units.

The IBM 3274 models 21A, 21B, 21C and 21D have 64K bytes of storage for the same prices as similarly configured models 1A, 1B, 1C and 1D. The new models are functionally compatible with the previous models, which will be provided on an as-available basis only.

IBM 3274 models 31A, 31C and 31D have 128K bytes of storage. The additional 64K bytes is provided at approximately the same cost as an additional 16K bytes on the previous models.

2400, 4800 and 9600 bps integrated modem features provide non-switched integrated modem capability on the 3274 model 31C. These integrated modems are microprocessor-based.

The new 3274 models will be built at IBM's plant at Greenock, Scotland, for European, Middle East and African countries. First customer shipments will be in August 1981.

IBM UK (CW), PO Box 41, North Harbour (Baille House), Portsmouth PO6 3AU. Tel: (0705) 694941 ext. 5279.

No need for cable in video terminal

A VIDEO terminal that has a microprocessor-controlled keyboard which does away with the traditional thick connecting cable has been unveiled by Texas Instruments.

Called the Opti 940, TI lists its main features as 16 operator-programmable function keys, up to 12 independent scrolling regions, 80- or 132-column display formats and the micro-controlled keyboard.

The keyboard chip is a Mostek 3780 with 2K of ROM, which multiplexes data to and from the keyboard. The keyboard is connected to the terminal via a thin, four-core wire and jack plug. This simplifies maintenance: engineers will now only have to change keyboards.

For user-oriented applications, one or three additional pages of display memory, tiltable display, operator changeable display filters and graphic character sets are available.

The screen can contain up to 1,920 characters and is 132 characters wide. Double high or double wide characters are also available.

For process control and data entry applications, the 940's screen can be divided into up to 12 independent scrolling regions with two vertical segments and up to six horizontal segments. Each region can independently display separate blocks of data simultaneously, allowing the operator to compare data and transmit specified data from a single region.

Within each region, the Opti 940 allows data verification and editing capabilities. The programmer can define separate fields within each region. For data verification, fields can be defined to accept numbers only, letters only or both. Data within a protected field can be identified as guarded information (not to be transmitted) or unguarded information (to be transmitted).

For database and time-sharing applications, where the operator regularly uses a set of sign-on characters, the 940 has up to 16 programmable function keys that generate a string of characters upon command. The keys can hold up to 128 characters in non-volatile memory collectively.

Selectable transmission speeds for character, line or block transmission modes range from 110 to 19,200 bits per second.

Deliveries are scheduled for June and they cost £1,180 each or £76,700 for 100.

Texas Instruments Ltd (CW), Manton Lane, Bedford MK41 7PA. Tel: (0234) 67466.

Sintrom offers discs

FOLLOWING the recently-announced contract with Control Data, Sintrom Electronics has added high capacity discs to its range of DEC-compatible systems.

Sintrom offers what it claims are complete subsystems for LSI-11 and PDP-11 incorporating Control Data models 9762 (80 megabyte) and 9766 (300 megabyte) storage module drives.

The subsystems employ microprocessor controllers utilising high speed bipolar technology to accommodate the data rates associated with high capacity drives, and full three sector buffering is used to allow multiple transfers without interlacing.

Hardware error correction is standard with a 16 bit CRC being used to check headers, and a 32 bit ECC being used to check data and correct error bursts up to 11 bits.

Built-in diagnostics test the subsystem on power-up with pass or fail indicated by board mounted LED.

The LSI-11 compatible subsystems use a quad size controller with a "piggy-back" microprocessor board and the whole requires two adjacent free slots with connection to the Q-bus being via one slot connector and presenting one bus load. The controller can connect one or two drives emulating DEC RM02/05 and the systems are DEC software transparent.

The controller for the PDP-11 compatible subsystem is implemented on a single hex-width board which connects up to four drives. A feature of this system is the adaptive DMA throttle whereby during each DMA transfer burst, the controller measures the waiting time for other pending NPR requests and interrupts its own DMA activity to permit other transfers to occur. Additionally, a programmable deadband is provided between bursts to ensure that CPU functions are not locked out for excessive periods by disconnects.

Sintrom Electronics (CW), 14 Acheright Road, Reading, Berks RG2 0LS. Tel: (0734) 85444.

ComputerWeekly brings you

COMPEC NORTH'81

Belle Vue, Manchester
June 23-25, 1981

--for the first time, an extension of the UK's largest computer show, COMPEC, comes to the heart of industrial Britain.

Computers, peripherals, terminals, software, mini- and micro-computers and services – the most comprehensive computer exhibition ever staged in the North of England.

Admission is by business registration and £2.00 at the door. **Save time and money by planning your visit now – send in advance for half-price tickets at £1.00 each and mark the dates in your diary –**

Tuesday, June 23: 10.00-18.00
Wednesday, June 24: 10.00-18.00
Thursday, June 25: 10.00-16.30

COMPEC NORTH'81

Sponsored by Computer Weekly, Data Processing, Systems International & Practical Computing.
Organised by IPC Exhibitions Ltd.

Please send ..... tickets; I enclose remittance of: £ .....
Compec North '81 Tickets, IPC Exhibitions Ltd
Surrey House, 1 Throwley Way, Sutton, Surrey SM1 4QQ
(cheques payable to IPC Business Press Ltd.)

Name _____
Company _____
Address _____
_____ CW

(Applications not accepted after June 8. No school parties, no children under 16)

marketplace

Contact Xenia White

For Advertising Rates PHONE: 01-661 3500 ext. 3571

SK Computer Systems Limited — DEC SYSTEMS FAST!

ST. MICHAEL'S HOUSE
NORTON WAY SOUTH
LETCHWORTH, HERTS SG6 1PB

- PDP® BASED COMPUTER SYSTEMS
- FULL RANGE OF SOFTWARE
- PER CALL OR CONTRACT MAINTENANCE AVAILABLE
- WIDE RANGE OF DEC® COMPATIBLES
- TEL: 04626 79331 TELEX: 825647

DIGITAL DATA
0462679331

systems and compatibles in stock

©DIGITAL EQUIPMENT Co.

★ PDP11/03® /TO VAX 11/780®
★ TOTAL DEC® OR COMPATIBLES
★ APPLICATION SOFTWARE

FAST DEC!™ FROM Systek

HR House, High Road, North Finchley, London N12 0AZ
Tel: 01-349 2911 Telex: 28227

™ These are registered trade-marks of Digital Equipment Corporation

---

Lambart COMPUTING DEC*

Specialist in DEC* and DEC* Compatible Equipment, Graphics and Communications Software

Low Cost Compatibles | PDP11 *Based Systems | DEC* Equipment Available

LS080-AS – 67MB Disc (RM02/3 compatible)
LS300-AS – 300MB Disc (RM05 compatible)
LM8016 – ½MB Add-in MOS for VAX 11780
LM800 12 – 64KW or 128KW Add-in MOS
LSDZ-16 – Single Board 16 Channel Mux
LTE-16 – NRZ/PE 45IPS Mag. Tape & Controller
LPL11–800LPM Band Printer and controller

RM03 – Add-On Drive
RL02 – 10MB Disc
MS780 – VAX Memory
LA120 – Printer Terminal
VT100 – V.D.U.
RP05 – Add-on Drive
DZ11-A – 8-line Asynchronous Mux

LAMBART COMPUTING
152 Moorbridge Road, Maidenhead, Berks SL6 8BN
Tel: 0628 72037. Telex: 848535
*Registered Trade Mark of Digital Equipment Co. Limited

BUY SELL TRADE DEC PDP11

For new/used Processors, Peripherals, Modules or complete systems

UPGRADES AND TRADE BACK

Processors, Memories, Peripherals

Call Peter Stock or Peter Hufton 0602-881774
Dectrade Ltd., 11 Musters Road, West Bridgford, Nottingham
Telex 377676 VIDEUR

IBM 129,029 PRINTING CARD PUNCHES

SORTER - REPRODUCERS - INTERPRETERS
★ EX STOCK ★ NEW/FULLY REFURBISHED
★ FULL WARRANTY ★ VARIOUS CODE OPTIONS
CDL COMMERCIAL DATA LTD.
Downham Road, Ramsden Heath, Billericay, Essex
TEL. BASILDON (0268) 710282

AIR FILTERS & MAGNETIC HEADS

Magnetic Heads and Air Filters available on stock for the following Disk Drives:
CDC, AMPEX, DATA GENERAL, DRI, DIABLO, CALCOMP, IBM, PERTEC, WANGCO, MEMOREX, IOMEC, ISS, BASF, ETC.
VAS COMPUTER PARTS AND ACCESSORIES LIMITED, TOWER HOUSE, COLLEGE ROAD, BROMLEY, KENT, ENGLAND. TELEPHONE: 01-464 5895. Telex: 896559 CALL US FOR FURTHER INFORMATION AND BROCHURES

We buy, sell and maintain DEC based systems.

For further details ring:
Paul Taylor, Mick Whitlam 0582 425861/2/3
Geoff Bramwell, 061-747 7177

Continuous Computer Stationery
Continuous Computer Stationery
Continuous Computer Stationery
Delivery 2 weeks

Phone or Telex for Quotation
Cornerways Press
Telephone (0582) 41234
Telex 825132 PRAKA G

FOR SALE

NCR Century 75, 16K, Printer, 2 x 656 disc units, paper tape. Also several Kode paper tape punch verifiers.

Offers to: 0246 74201

1981 FEATURES PROGRAMME

30 April
– Compec Europe Preview/Competition from Abroad
14 May
– National Computer Conference Report
28 May
– Data Input Techniques
18 June
– International Word Processing Show Preview/The Automated Office

Contact: David Hogan on 01-661 3500

KIENZLE COMPUTER 2003S/8K

Complete as new
£6,950
with software
Phone Mr. Ridley
0702 331188

FOR SALE

Hewlett Packard HP9835-A, hardly used.

Phone: E. Mueller
Blythe Bridge
(07818) 6918

NEW DEC EQUIPMENT FOR SALE

★ 11-44/CB 256KB ECC TU58 9842 CAB
★ 11-34/LF 64KB 10.6 BOX DL11-W 9312 etc
★ RL01 Drives and Packs available
★ VT100-AB and advanced video option
★ LA 120-DA DEC Writer

Telex 335001
Contact: Ron/Bill – SYSCOM LTD.
Phone 0384 238701

FOR SALE NEW

ADM3A, TVI912C, £460, ADM3A, ADM5A ... VT52 & RS232 graphic option, VT100 (with VT640 graphic option), Teletype 43, Anadex ... Printers and various interface cables at very competitive prices. ... Microcomputers, VDUs and Printers. A. W. Computer Engineering Co. Tel 01-761 2198 up to 8 pm.

DEC VT05 Terminals required

2 x 8K boards core memory for PDP8E and information on access to DEC 300 to enable modification to multi-terminal and VT05, VT52/100 interrupts.

Phone 0273 ...

FOR SALE

DEC PDP8A
32K Byte, 1Mb Disc
1 Printer, 1 VDU 2 years old
Offers
Telephone 0273 413486
(Peter Thaxter)

TOTAL COVERAGE

Whatever your staffing need, you need Knight ... years in the industry has given us a powerful reputation ... could be the answer. We're Knight. We got big by solving staff problems: contract or permanent.

Knight Computer Services Limited,
14 Old Park Lane, London W1Y 4NL
01-491 4706 and 01-499 3411
Telex 21346

Knight

RSTS™ ON DEC™ LSI 11-23

RSTS VERSION 7 NOW AVAILABLE ON THE LSI 11-23 FROM ADOS – THE RSTS PROFESSIONALS

ADOS, 243 REGENT STREET, LONDON W1R 8PN
TEL: 01-439 0138

Digital Equipment Company Ltd.

Computers Bought and Sold

E O B LIMITED

IBM SYSTEM 34

5340-D34 96K 2D Diskette Reader, 5211-2 300 LPM Printer, 6 x 5251-11 VDUs.

ICL 7502

6 ICL 7502-3, 40 VDU/KBs.

Tel: 0783-44777
Telex: 537763

WANTED IBM, ICL COMPUTERS

We specialise in buying and de-commissioning computer equipment.

Reybold Computer Services, Unit 12 West Station Industrial Estate Spital Road, Maldon, Essex
Tel. Maldon (0621) 54666

PROFESSIONALLY WRITTEN

USER GUIDES

and SYSTEM DOCUMENTATION FOR YOUR SOFTWARE
EASTERN BUSINESS SYSTEMS
Tel. 0279-31867
24-hour

NEW/USED COMPUTER EQUIPMENT BUY OR SELL THROUGH WDP

SAMPLE UNITS AVAILABLE FOR SALE:

IBM 3348 Data Modules
5 x Dryco 4000 8 mag. disc drives
DG Nova 210
Vanlek Data Point 2200
NCR 8200 and 8250 Systems, etc, etc.

NEW DE LUXE 80 COLUMN HAND PUNCHES (EX-STOCK) WDP

01-464 8011
TELEX 896889

WEBSTER D/P SERVICES LTD.
65 WIDMORE ROAD, BROMLEY
KENT BR1 3AA

DEC and DATA GENERAL

Buy, Sell or Trade

Immediately available:

- ULMS MUX
- Nova 2/3/4 Memory
- MMB-EJ
- 11/34 Memory (MS 11-LD)

Call: Alastair Dods, 01-464 0942

Thomas Business Systems, Ltd.

FOR SALE

7 Anadex DP8000 Printers

Surplus to requirements and hardly used. Recently fully serviced. 1K Memory and adjustable printable width.

£299 o.n.o.

Phone (Computer Room) 01-205 6844

FOR SALE

Chubb CP4 Fire Safe
Offers Invited
Telephone:
0621-58210/56422

TEX 4014-1 Terminal TEK 4954 Tablet Benson 1302 Plotter

Ex-demo, available immediately.
Offers invited.
Telephone 0602 886746

BARLEY MOW WORKSPACE

Chiswick, London W4

Easy access to M4, M1, M3, Heathrow Airport. Good public transport facilities.

A few office/design studio and workshop spaces available for immediate occupation at low "rental". Flexible use of small areas from 100 s.f. upwards.

"Here the Emphasis is on the wide range of services – including an excellent restaurant, conference facilities, rest rooms and showers, showrooms, receptionist and telephonist, telex, as well as providing central heating, cleaning and maintenance. Optional extras include secretarial services, translations, photocopying, printing and accountancy. The conversion, which includes close carpeting and pictures on the white-painted walls, has attracted a good cross-section of small businesses."
'Country Life'

"The mix of small firms has created an interchange and interdependence of various skills. The common services have relieved people who have special skills of some of the management chores which consume time and money."
'The Guardian'

For further details and appointment to view please contact Peter Shearmur, A.R.I.C.S., or Hazel Clayton on 01-994 5477.

ATTENTION! ATTENTION! ATTENTION

Do you have any unused or redundant computer equipment that you want to sell? If so, call me, Xenia White, to find out how easy it is to place an advertisement in the Market Place section of Computer Weekly and reach over 100,000 Computer People in this country.

My telephone number is 01-661 3500, Ext. 3571

DON'T DELAY – CALL TODAY!

FOR SALE

4 x NCR 32 with Paper Tape Punches
Kode 77 Paper Tape Punch and Verifier
50 x NCR 655 Disc Packs, 5 Megabyte
Offers please
Don Wood, York Trailer Co. Ltd.
Northallerton, North Yorkshire
Tel: 0609 3155

FOR SALE NEW

ADM3A, TVI912C, £460, ADM3A, ADM5A ... VT52 & RS232 graphic option, VT100 (with VT640 graphic option), Teletype 43, Anadex ... Printers and various interface cables at very competitive prices. We also provide maintenance on Microcomputers, VDUs and Printers. A. W. Computer Engineering Co. Tel 01-761 2198 up to 8 pm.

PUNCHING PROBLEMS?

We are the established specialists for

DATA PREPARATION

HUGE CAPACITY
01-837 3877 & 636 3826

TEMP & PERM PUNCH OPS

All machines and areas
01-222 1166 & 886 2679

RING US NOW FOR PROMPT, ECONOMICAL & EFFICIENT SERVICE

House of Cards

Diablo Printers Special Offer

1640KSR – £1795
1355WP – £1495

Whilst current stocks last

comart

PO Box 2, St Neots
HUNTINGDON Cambs PE19 4AF
Tel: (0480) 215005
Telex: 32514 Comart G

FOR SALE

DEC 11/34 A CTS (128) LA36
5 x RK07
2 x VT100-AB
2 x VT52-AB
2 x Hazeltine 1552
1 year old
Details from and offers to: ... Lloyds and ... Exeter. Tel: ...

SUPERLATIVE USED COMPUTER EQUIPMENT – AS NEW CONDITION

DEC PROCESSORS

PDP 11/03-SD Processor in 3½in Chassis complete with 16KW MOS Memory and EIS option NEW £1495.00

PDP 11/04 Processor in 10½in Chassis complete with 16KW MOS Memory and DL11W Interface (can be enhanced to 28KW) NEW £4500.00

PDP 11/34 Processor (non-A) in 10½in Chassis complete with 128KB MOS Memory, DL11W Interface and Programmers Front Panel £5900.00

DEC TERMINALS

LA 34 DECwriter IV with RS232 Interface and tractor Feed Option £495.00
LA 36 DECwriter II with RS232 Interface £750.00
VT 52 DECscope with RS232 Interface £450.00
VT 55 DECscope graphics terminal with integral hard copier £1900.00

DEC MEMORY

MM11OP 16KW core ONLY £395.00
MS11JP 16KW MOS £675.00
MSV11-C ... (LSI 11) £495.00
MM11-DE 64KW MOS (11/70) £3950.00

DEC DISKS

RK05-J 2.5 Meg. add-on disk drive from £1850.00
RL01-AK 5 Meg. add-on disk drive £1975.00
RK06 14 Meg. add-on disk drive from £3250.00
RK07-ED 28 Meg. add-on disk drive P.O.A.

DEC OPTIONS – PDP11 SERIES

DD11A 4-slot system unit £125.00
DD11B 4-slot system unit £150.00
DL11 Serial Interface £250.00
DL11WA/B Serial Interface/Line Clock £395.00
DZ11B 8-line Expander MUX £995.00
FP11A Floating Point £1750.00
M9301-YB Bootstrap £325.00

DEC OPTIONS – PDP8 SERIES

DP8EB Communications Adaptor £395.00
KA8E Positive I/O Bus £95.00
KD8E Databreak £145.00
KL8E Asynchronous Interface £250.00
KL8JA Asynchronous Interface £275.00
KP8E Power fail/auto restart £95.00
MM8E 4KW Core memory stack £350.00

Hazeltine VDU's

WE SELL WE BUY

ELECTRONIC BROKERS LTD

FOR SALE INTERDATA 7/32 MINI COMPUTER

(2 YEARS OLD)

Due to the recent closure of a major business unit within the Sidlaw Industries Group, the following small but powerful configuration is offered for sale:

★ 256K Interdata 7/32 Processor with either V.D.U. or carousel consoles
★ 2 x 67 megabyte disc drives and 6 disc packs
★ 1 x 9 track 800 B.P.I., N.R.Z.1, 36 KBS tape system and a number of tapes
★ 1 x 500 l.p.m. line printer

The installation can support a network of terminals situated either locally or remote via modems.
The dynamic operating system can handle concurrent background batch, foreground on-line and interactive software developments written in Cobol.
A wide range of editing, data communication and transaction processing facilities is available.
Cincom Total Data-base Management System is available for use.
The configuration is capable of supporting other high-level languages.

For future details contact: Mr A. R. R. ALLAN
Group M.I.S. Manager
Sidlaw Industries Limited
Nethergate Centre
Dundee DD1 4BR
or
Telephone Dundee 23161 ext. 221

'Sandwich' course in computerese

Computing: Level II by R. S. Morland. 153pp. Van Nostrand Reinhold Company.

COMBINING Business Education and Technical Education – BEC/TEC – was an ambitious attempt, largely promoted by the NCC, to achieve a broad balance between the requirements of the academic and business worlds.

The resultant rush of authors and publishers to produce the definitive standard textbook has been staggering.

Rewards for the successful will be considerable, ranging from school and college adopted text books to possible versions designed for the Milton Keynes-based Open University.

Matching the conflicting requirements has been something of a challenge. This particular book attempts to bridge the technology gap by having theoretical material in odd-numbered and practical content in even-numbered chapters.

Appropriately, this is known as a "sandwich" style, an interesting, if puzzling approach for the reader.

While advice in Elementary Boolean Algebra is lavish, once again little regard is paid to the importance of such practical matters as documentation and debugging procedures.

According to the text, an interesting version of direct access is that of extracting those punch cards with (or without) corner tabs from the file.

Computing: Level II is not recommended reading for those wishing to gain an insight into contemporary commercial computing.

ALAN SIMPSON

Academic curate's egg should prove useful

Approaches to Programming by Brian Jackson. pp104. Blackie & Son Ltd.

PUBLISHERS Blackie & Son are noted producers of scholastic books and this new work certainly follows the tradition closely.

It is junior academy-shaped, narrow and slender, and the author hails from an Advisory Unit for Computer Education in Essex.

In fact, the Approach to Programming involved is decidedly academic. Computer hardware development appears to have halted with the birth of the punch card, while such modest matters as documentation and good standards are totally neglected.

Those mastering the book are assured of a GCE A-Level award and will emerge well qualified in Cobol, Fortran and Basic. The book could also well serve as a good introduction to IDPM and BCS industrial qualifications, at least to the first stages.

While there is no doubting the technical excellence of the book, the author frequently finds himself up a grammatical tree.

A.S.

Advanced steps in Fortran practice

Exercices Commentés De Fortran by Marc Thorin, 109pp. Editions Masson. 120, Bd. St. Germain, 75280 Paris.

AS its name suggests, this book provides a set of exercises designed to give the Fortran student some experience in using the language, and is intended to help those who have mastered the basics to overcome three types of problem.

First is the assimilation of Fortran syntax, which was determined partly by the limitations of the computers used at the time of its development.

It also seeks to extend the use of the language without applying it inappropriately.

Thirdly, the author seeks development of a methodical approach to analysis and programming.

In the second section, Thorin recommends methods of widening the student's Fortran experience, suggesting that he or she should set personal examples for practice, make use of appropriate manuals and compare Fortran with other computer languages.

The third section encourages clear thinking in analysis and a methodical approach to programming.

Technical sections might well be comprehensible to non-linguists but a good knowledge of French will be necessary in order to understand the explanations and benefit from Thorin's advice.

ROSEMARY SHEPHEARD

John Cookson reviews four books on program languages

Definitive Basic primer but on wrong subject

Structured Basic and Beyond by Wayne Amsbury. Computer Science Press Inc.

NUMEROUS books have been produced to provide simple introductions to Basic, most of which are extremely poor. For a long time I have wondered what a really "good" book on the language would be like and this work largely answers the question.

Dr Amsbury makes an excellent job of dealing with one of the fundamental flaws of many books on the subject, that is, the problem posed by a muldplicity of dialects.

He avoids this by presenting a fairly simple dialect thereby making the examples more applicable to users of other versions.

The author recognises the difficulties lack of standardisation causes and draws attention to them in relevant places in the text. He makes some appropriately despairing comments on the proposed Basic standard in an appendix.

A second common problem of Basic texts is how they deal with the subject of structured programming and program design. Many Basic texts are useless since they ignore this topic.

Others refer to Basic versions with structured programming features built into an extended form of the language. Such texts are only useful to readers who have the same Basic version as the author.

Dr Amsbury has taken a sensible approach, presenting the language clearly and concisely and introducing structured programming concepts as he expounds on the features of the Basic language.

The student learns to implement the "standard" control structures as sequences of simple Basic commands and the use of pseudocode rather than flowcharts to describe algorithms is very welcome.

The third major flaw of many Basic books is the collection of examples chosen, which are generally trivial, badly chosen and poorly thought-out.

In this book the examples are extremely well chosen, tending towards being over-ambitious rather than trivial.

These include problems dealing with files, linked lists, stacks and queues, trees and heaps which would provide for the conscientious student a worthwhile and brief introduction to data structures.

I believe this book to be unique and highly recommended for those constrained to use the language and the work is admirable except in one critical respect.

I have the gravest doubts about what the effect on students would be of seeing clear and simple algorithms in pseudocode translated into long-winded, unreadable and incomprehensible Basic.

Despite the author's superb effort to present a first-class text, paradoxically he has confirmed a long-held personal suspicion that an excellent text on Basic would focus attention on the language's inadequacies.

The overwhelming impression created by the end of the book is that Basic is an appalling language for all but the most trivial applications.

It is a great pity that Dr Amsbury chose the language he did, because inside this book on Basic there is an excellent work on Pascal waiting to come out.

A guide to syntax, not an aid

Structured Fortran with WATFIV-S by Paul Cress, Paul Dirksen and J. Wesley Graham. Prentice Hall Inc., Englewood Cliffs, N.J. 07632.

WATFIV-S is the latest in a series of compilers developed at the University of Waterloo, Ontario, early members of the series being Fortran compilers with modest amendments.

Now with WATFIV-S, version 2, we are approaching a language which is basically amendments with a modest core of Fortran.

Since there are two potential audiences for this book, the WATFIV and the Fortran communities, two separate assessments of its suitability are indicated.

WATFIV-S contains Fortran-IV as a subset and those aspects of WATFIV which it shares with Fortran are dealt with generally accurately and comprehensively.

In the text, no indication is given which features are specific to this dialect and which are standard Fortran. There is no discussion of what constructs it is sensible to use and which are inadvisable.

Thus the arithmetic IF and GOTO are introduced without any suggestion as to how they may best be used.

In view of the manifest problems many programmers have with COMMON blocks, it is a pity that this topic was not treated in more depth.

Depth has been sacrificed for comprehensiveness and the text is a guide to the syntax, rather than an aid to program design using the language.

Cobol student's case study

Cobol: A Vehicle for Information Systems, by Robert T. Grauer. Prentice-Hall International.

COMMONLY, instructional texts on programming follow the same pattern. Each feature of the language and some trivial examples based on that aspect are presented until the complete set of features is exhausted.

My experience as a student and later as a teacher of programming has convinced me that this method does not teach anyone to become an effective programmer. Most people only become good at programming after tackling a substantial programming task.

This would suggest that a textbook which treated a major programming application rather than small problems could be very effective.

Teaching Cobol programming is particularly difficult and most texts on the subject are turgid and boring. The problem is that Cobol dissociated from its natural context of serious business applications has little intrinsically to motivate the student.

Robert Grauer's book is a very successful attempt to address the problems mentioned above. The first few chapters present a well-written and brief introduction to basic Cobol, including an excellent section on debugging.

The bulk of the book deals with a fairly substantial application involving a personnel system. As the development of the system proceeds, more Cobol is introduced as it becomes applicable.

Pseudocode is used as a design aid rather than flowcharts and the principles of structured program design are briefly outlined.

It is nice to see in student texts references to structured walkthroughs, good style, programming standards, the actual use of the system and its maintenance and top-down testing. By the end of the case study, the student has got as far as the use of ISAM files.

Over-zealous missionary

Basic Fortran by James Coan. Hayden Book Co., Inc., Rochelle Park, New Jersey.

AT THIS stage in the history of Fortran there needs to be an extremely good reason for adding to the already enormous collection of books on the language.

If a book offered a novel approach, a brilliant exposition, some extremely well-thought-out examples or a specific orientation to ANSI-77 Fortran, it would have some claim for consideration. This book offers none of these.

The style of the author is that of an American missionary preaching to cannibals. This might be bearable if the book in almost all of its content and approach were not ten years out of date. Typically, the author makes extensive use of flowcharts.

"Basic Fortran" is clearly intended to appeal to the microcomputer user and the book refers specifically to Cromemco and Fortran-80 versions of ANSI-66 Fortran.

The strategy the author follows is to provide an extremely brief introduction to the language supported by a large number of examples. Unfortunately, these examples are all directed towards numerical problems.

No character handling exercises are provided and the section on characters, all two pages of it, makes no reference to ANSI-77 Fortran, in the one place in the book where it would be most sensible to do so.

Specific reference to ANSI-77 Fortran is made in the introduction and elsewhere in the text, however.

The text is too sketchy and inadequate to be recommended to the student programmer and there are significant omissions: COMMON variables, COMMON direct access files.

Often where the author deals with a feature of the language, treatment is so superficial that it is unlikely that the novice could use the construct safely.

Although the author pays lip service to structured programming principles, there is little evidence of good structure in the examples which are also poorly documented.

Nowhere is any indication given of the best and most intelligent use of the constructs of the language.

The Arithmetic IF, the GOTO and the computed GOTO are presented without any warning that using them indiscriminately in a program may seriously endanger its health.

In conclusion, Basic Fortran cannot be recommended under any circumstances.

It had to come. The Gulf Computer Exhibition.

The way business and government is expanding in the Arabian Gulf has created a dynamic computer market.

Manufacturers with offices or agents there talk about annual growth rates of over 20% (and in some cases 100%).

This interest in products and systems has brought about the First Gulf Computer Exhibition and Conference—a trade exhibition covering hardware, software, peripherals, accessories, word processing, micro systems and services.

And coming to it will be directors, senior management, government officials and potential agents—the all important people who influence purchases, from the UAE, Qatar, Oman, Bahrain, Yemen, Kuwait and Saudi Arabia.

Why Dubai?

Dubai is the regional management centre of the Gulf. It's a long-established trading centre with excellent facilities and a friendly atmosphere.

It also boasts the Dubai International Trade Centre, which includes the only purpose-built fully air-conditioned Exhibition Hall in the Gulf, with sophisticated under-floor power and telephone supply.

So exhibitors can demonstrate their products in ideal conditions.

It has certainly proved its success as an exhibition. The last trade show there brought in visitors from 17 countries.

Who's making the arrangements?

The Exhibition is being organised by Trade Centre Management Company in association with Computer Weekly, who will be running the conference.

It has the full support of the Dubai Government and Chamber of Commerce.

If you want to know more call us or fill in the coupon below.

Don't you have to come too?

GULF COMPUTER EXHIBITION 15-19 DEC 1981 DUBAI INTERNATIONAL TRADE CENTRE

To Trade Centre Management Company,
London 17 Waterloo Place, London SE1Y 4AR. Telephone 01-930 3881. Telex 888193 CENMAV G.
Dubai PO Box 9292, Dubai, UAE. Telephone 47200. Telex 47474 DTC EM.

Name _____ Position _____
Company _____ Address _____
Telephone _____

Appointments

THE NEWSPAPER COMPUTER PEOPLE RELY ON

Appointments

ComputerWeekly

Classified Department Quadrant House The Quadrant Sutton Surrey SM2 5AS

Box Numbers: Should be addressed to the box number in the advertisement c/o Computer Weekly at the above address

Classified Rates: £10 per scc
19 x 3 cols = £872 39 x 3 cols = £1,470
Half Page (19 x 7 cols) = £1,530
39 x 4 cols = £1,792
Full Page (39 x 7 cols) = £2,900

Copy Deadline: 3.30 pm Monday prior Thursday publication date. Complete artwork up to 11 am Tuesday. Advanced space reservation is advisable

LONDON 01-661 0121 (8 lines)
Chris Pratt Assistant Classified Manager
Neil McDonnell: Classified Supervisor
Ian Faur Consultancies
Julie Hannaford Consultancies
Denise Smith General Appointments
Gilvyn Johnson General Appointments
Kevin McOwen General Appointments
Peter Rees General Appointments

MANCHESTER/GLASGOW
Owen Kelly 061-872 8861
Geoff Aiken 061 872 8861

BIRMINGHAM/BRISTOL
Vic Sherel 021-356 4838

Classified Production 01-661 3500 Ext. 3104 Steve Lever

MYRIAD

OFFICE AUTOMATION SOFTWARE DEVELOPMENT MANAGERS

FIVE-FIGURE SALARY

Several MANAGERS are required to lead teams of high-calibre professional engineers developing microprocessor systems at the heart of the country's most advanced electronic office system. They will be directly responsible for the software development of a product that will encompass wordprocessing, electronic mail, message switching, telephony support packages, end user high-level languages, local area networking and many other specialised office software forming the centre of the business communication complex of tomorrow.

These senior positions will lead highly competent system software development teams.

They will have direct line responsibility for designing, developing and maintaining software implementation schedules.

Software being developed covers all aspects of operating system and system software including linkers, loaders, debugging aids, monitors, configurators, and file integrity checking routines, together with a wide variety of software tools necessary in the office automation environment.

Candidates are likely to have had over 5 years' experience of software development in a computing environment ideally with a proven software managerial record.

Located in the EAST MIDLANDS, our client offers a five-figure salary with a full range of employee benefits including BUPA and generous relocation expenses.

REF: S2/1604

MYRIAD APPOINTMENTS LIMITED
30 Fleet Street London EC4Y 1AA Telephone 01-353 0981 24 hours

لهكذا عنه الأصل

SAUDI ARABIA

Your experience with IBM 4331 computers could be very rewarding right now.

We are seeking Systems/Software Managers, Analysts/Programmers and Operators willing to work in challenging roles in the Kingdom with major companies.

Benefits would include annual bonus, car allowance, free accommodation/medical care and generous annual leave with tickets to point of origin.

If the prospect of working abroad appeals to you, please send a detailed C.V. with photographs to A. Marchent at Ensercon Ltd., 64-72 High Street, Harpenden, Herts, AL5 2SP.

ENSERCON LTD

SALES STAFF
required to operate and demonstrate
ELECTRONIC AND VIDEO GAMES – CHESS COMPUTERS etc.
If you enjoy meeting people, you'll enjoy a sales career using computer electronic experience to London's West End. Write with details of C.V. and relevant background facts to:
Managing Director
The Games Centre,
22 Oxford Street, London W1A 2LB
(0341)

Suffolk Magistrates' Courts Committee
Applications are invited for the appointment of a
COMPUTER SYSTEMS OFFICER

SALES EXECUTIVES

London and Home Counties c. £16,500 + Car

Cable and Wireless UK Services Ltd., a subsidiary of the International Cable and Wireless Group, is skilled in the design, installation and maintenance of TELECOMMUNICATIONS and DATA PROCESSING SYSTEMS. Currently, we are selling production control and financial packages on minicomputer systems, complemented by a range of cluster systems capable of interfacing with IBM, Univac and ICL machines. This exciting product range together with our unique nationwide support services and aggressive marketing policy has created vacancies for ambitious Sales Executives to contribute to our further expansion and share the benefits of our success.

Ideally, applicants will have extensive minicomputer hardware sales experience together with a production control or accounting background and a track record of proven success in this field. In return we can offer a competitive basic salary, company car or allowance and a generous commission scheme with no upper earnings limit. These are senior positions and the successful candidates will be expected to make a real contribution to the policy and growth of the department.

All these appointments are open to men or women, and successful candidates can expect good promotion prospects, a salary package which will fully reflect their skills, and the many other benefits associated with a modern company in the forefront of technology.

To apply please write enclosing a c.v. or telephone: Susan Derby, Cable and Wireless UK Services Ltd., 83 Blackfriars Road, London SE1 8HQ. Tel: 01-633 9577.

CWUKS

CABLE & WIRELESS UK SERVICES LIMITED

KUWAIT

Kuwait has the lowest inflation rate in the world, with a cost of living lower than in the U.K. There is a socially active, large expatriate community with many facilities, such as sports centres, English speaking TV and reasonably priced restaurants.

Our client is a highly successful distributor for two major international organisations and has established a large base of prestigious users in Kuwait and now wishes to make two important appointments.

SALES EXECUTIVE
WORD PROCESSING SYSTEMS
Good basic salary, minimum target income
£16000 — TAX FREE
No upper limit

MAINTENANCE ENGINEER
KEY-TO-DISK AND MINI COMPUTER SYSTEMS
Earnings scale from
£11,000 upwards — Tax free

plus

- Rent free, air conditioned accommodation
- Free, air conditioned car
- Return air flights to U.K., twice yearly

DPSC INTERNATIONAL LIMITED
Crown House, Morden, Surrey, SM4 5EU. London, England. Tel: London (01) 540 8311
Contact PETER COOPER at the above number, daytime — evenings/weekends: Ashtead 77032
(STD 03722 — London 27)

MVS Systems Programming

Netherlands c.£2,100/month

An experienced MVS Systems Programmer is required to join two of our software consultants providing technical support to an expanding Data Centre in the Netherlands. The successful applicant will be assigned to a small MVS group where in addition to normal implementation and maintenance duties responsibilities will include both assisting the Head of the Group with the planning of new releases and providing technical support to junior members of the team. The Centre comprises multiple 303X cpu's running MVS 3.8 SE II (SP planned) supporting a large network of remote terminals through such facilities as JES2 RJE, ACF, TSO, VSPC, IMS/VS and VM/CMS.

IMS Technical Support

Holland £1,900/month

We are seeking a technically oriented Analyst Programmer to work with a small team in the Netherlands on the development of an international data collection and distribution system based on a centralised IMS Database. Duties will include the provision of IMS technical support to the group as well as the design and implementation of enhancements to improve system efficiency. In addition to a thorough knowledge of IMS DB/DC candidates should have Cobol experience and a knowledge of assembler would be an additional advantage.

CDS is a 45 strong Anglo-Swiss Consultancy specialising in the following areas:
- Systems Programming — MVS, VS1, VM, OS/VSE, ACF, IMS/VS, CICS/VS.
- DB/DC Application Development — Particularly IMS DB/DC, DL1 & CICS.

For further details of the above positions or for an informal discussion on future European or UK assignments please contact us at our UK offices or on our private numbers at evenings/weekends. Brian Bidston 03448-5385 or Jim Shaw 0990-24546.

[5257]

cds The IBM System Software Specialists

CDS Ltd, 97–73 Park Street, Camberley, Surrey GU15 3PE. Tel. 0276 26845 Telex 858062

JBA

Programmers Middle East

£13,600 - £15,600

Opportunities exist for high calibre people to join one of the most successful and increasingly developing international organisations. The pre requisite being a minimum of three years programming in a fast moving commercial environment. Also to possess a degree, HNC or equivalent qualification. A desire to perform systems activities related to T/P network administration, site analysis and operations interface procedures is needed as these are the areas that career development will be related to.

It is envisaged that the transition into systems analysis will take one to two years.

Successful candidates will be engaged on single status, but generous leave and travel to the U.K. will be offered by the company.

Contact: Janet Chilvers,
JAMES BAKER ASSOCIATES,
International Personnel Consultants,
32 Savile Row, London W1.
Tel: 01-439 9311.

Sales Executive
Data Capture
£10,000
base salary
+ £5,000 1st year guarantee
+ commission
+ 2 litre car
Western Home Counties

A unique opportunity to sell a new concept

One of Britain's leading data capture experts have developed and recently launched a new, highly flexible system.

They are part of an all British group, operating autonomously but, as part of a £75M turnover group operation, they enjoy real financial stability. All group companies either manufacture or distribute components or other high technology products such as complete microprocessor based systems. Group growth rate over the last ten years has averaged a rate of 30% a year for both turnover and profit.

The product is a hand-held micro computer with full alpha-numeric keyboard and display. It is capable of two-way communication by telephone or directly to any mainframe or mini computer. Used in conjunction with various items of peripheral equipment, it has major applications in wholesale and retail sales operations, stock control, financial auditing and batch production control, to name only a few.

As a result of the rapid expansion of this market the company wishes to establish a UK sales organisation in 1981/1982. With a typical installation cost of £500,000 plus, your brief will be to research the market, develop a sales strategy and successfully negotiate with major companies. By achieving this, progression will occur into sales management or marketing, depending on your own ambitions.

This is a rare, ground-floor opportunity offered to a capable negotiator, ideally between 30/40 years old and experienced in data processing systems, customised computer installations or systems analysis.

For further information and immediate confidential interview, telephone Peter Dudgeon on 01-935 0671 (24-hour answering service) or 01-674 8627 (evenings and weekends).

VRL
Specialist Computer Recruitment Ltd.

London 01-935 0671 3 Mandeville Place, Wilmore Street, London W1M 5LB.
Birmingham 021-236-3781 35-37 Great Charles Street, Queensway, Birmingham B3 3JY.
Manchester 061-833 0427 Blecktriars House, The Parsonage, Manchester M3 2JA.
Brussels 010 322-640.7161/71 Avenue Louise 327, Bolte 4, 1050 Bruxelles.
Amsterdam 010 3120-780947 Willemsparkweg 92, 1071 H.M. Amsterdam.

SYSTEMS & PROGRAMMING

IBM TECHNICAL SUPPORT PROGRAMMER — MIDDLESEX £7,000 + neg
Up to 2 years technical support on ISM systems with Assembler knowledge. Ref: 9236BP

IBM SYSTEMS PROGRAMMER — MIDDLESEX to £10,500
Minimum 2 years IBM OOS Systems Programming, Assembler and Cobol exp. Ref: 9260SP

HONEYWELL PROGRAMMER — MIDDLESEX to £7,500
Up to 2 years GCOS Cobol experience Level 64 on-line systems an advantage. Ref: 9246SP

HP-1000/3000 PROJECT LEADER — MIDDLESEX to £10,000+Car
Either HP-1000 RTE, Image, Fortran or HP-3000 MPE, Image, Cobol. Ref: 9247SP

DEC SYSTEMS ENGINEER — MIDDLESEX to £10,000 + Car
Technical experience of PDP11 under RSX or REST8/E and Macro-11. Ref: 9247SP

MOVE ONTO IBM! — HERTFORDSHIRE to £11,000
Programmers, Analyst/Programmers. Either 2 years ISM Cobol or 3 years Cobol (any mainframe), 8100 exp. an advantage. Ref: 9262SP

IBM PLI PROGRAMMER — HERTFORDSHIRE to £9,500
2 years + PLI. Assembler an advantage. Mortgage subsidy. Ref: 9235SP

IBM SYSTEMS PROGRAMMERS — HAMPSHIRE to £10,000
Exp. in installing, maintaining OS/MVS operating systems. CICS an advantage. Ref: 9256SP

PROGRAMMERS, ANALYST/PROGRAMMERS — BERKSHIRE £7,000-£10,000
Minimum 1 year's high level language on mini based systems. HP3000 an advantage. Ref: 9241BP

IBM ANALYST/PROGRAMMER — WEST LONDON £9,500
Minimum 3 years IBM Cobol and some Analysis experience. CICS/DLI an advantage. Ref: 9242SP

IBM PROGRAMMERS, ANALYSTS — CENTRAL LONDON £8,000-£10,000
2 years + IBM Cobol, CICS and Database an advantage. Commercial systems. Ref: 9204/SP

CONTRACT STAFF

We have an increasing demand for experienced DP staff, available now or in the future.

If you are currently a contractor or just considering it, phone now to discuss your requirements.

We will be pleased to hear from you!

Some of our immediate requirements for the South:

Analyses – Life Assurance exp. – 6 months
Analyst/Programmers – Honeywell IDS/TDS – 12 months
Programmer – NCR Neat 3/Level 2 – 6 months

OPERATORS + ENGINEERING

FIELD SERVICE ENGINEERS — HANTS £7,000 + neg + Car
3-5 years DEC with good knowledge of LSI II + Hard Disc sub systems. HNC an advantage. Ref: 9246EN

JUNIOR ENGINEERS — W. LONDON £A.A.E.
Tops course in Field Engineering or knowledge of engineering. Ref: 9265EN

SENIOR ENGINEERS — W. LONDON £A.A.E.
2-3 years Field Engineering experience. Ref: 9266EN

SHIFT LEADERS — W. LONDON £7,000
Sound Honeywell GCOS Level 6 preferable. Ref: 9244OP

IBM SENIOR OPERATOR — SOUTH COAST £neg
2 years +, MVS operating experience but will consider OS. Ref: 9265OP

BURROUGHS OPERATOR — LONDON to £5,500
1 year +, Burroughs medium sized (B3700, 4700, 2800, etc). MCP. Ref: 9261OP

MANAGEMENT & EXECUTIVE

SALES EXECUTIVES — HOME COUNTIES £15-£20,000
We have several current positions for sales people with a sound track record in computer related marketing. We are particularly interested in personnel with a minicomputer or bureau computer services background.

PROJECT MANAGER — HERTFORDSHIRE to £18,500
Newly formed Computer Services Bureau is seeking an entrepreneurial Manager to oversee their distributed processing network. A sound background in IBM mainframe developments coupled with extensive analysis experience, preferably in the retail industry is necessary.

NAME.....
ADDRESS.....
.....
.....
Tel. No. Home .....
Office.....
CURRENT POSITION .....
(Permenent/Contract) delete
POSITION SOUGHT.....
(Permenent/Contract) delete
CURRENT SALARY/RATE £.....
EXPERIENCE SUMMARY (Hardware/Language, etc)
.....
.....
.....
.....
.....

To: Viking Recruitment Ltd., Freepost, Harrow, Middlesex, HA1 2BR (no stamp required)

[6214]

There are many other vacancies phone now. Or complete and return attached coupon.

VRL
VIKING RECRUITMENT LIMITED
Viking House, Peterborough Rd.
Harrow, Middlesex HA1 2XU

01-423 2166
OR 01-423 1963
(24 hours)

THORBAR

A DIVISION OF INBUCON MANAGEMENT CONSULTANTS LIMITED

CITY/E.C.1

ANALYST PROGRAMMER - CIRCA £7,500 PER ANNUM

+ VERY ATTRACTIVE FRINGE BENEFITS–WHICH INCLUDE:

PROFIT SHARING, FREE LUNCHES, SPORTS AND SOCIAL CLUB, SEASON-TICKET LOANS, ETC.

ARE YOU SEEKING A NEW OPPORTUNITY TO PROGRESS YOUR CAREER?

We wish to identify a young Computer Professional with s sound Programming background who would likc to dcvelop his/her skills in an expanding On-Line environment. The existing D.P. fscilities will be addcd to with the delivery of a second mainframe this year.

Thc auccessful candidstc will ideally portray the following levels of experience:

★ A sound Programming background (preferably MUMPS) with experience gained from working in an On-Line cnvironment.

★ The ability to design Systems Specificatioos with a view to developing programs up to snd including the testing stage.

THIS IS A FIRST-CLASS OPPORTUNITY FOR A PERSON TO JOIN A YOUNG D.P. TEAM WORKING FOR A FORWARD-LOOKING COMPANY WHICH IS DESIGNED TO EXPANSION AND USES THE LATEST D.P. TECHNOLOGY FOR ITS DEVELOPMENT.

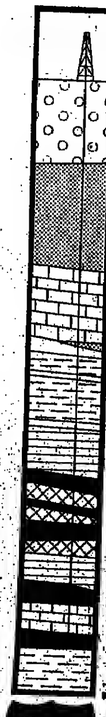
SHOULD THE SELECTED CANDIDATE FOR THIS POSITION REQUIRE SPECIAL TRAINING – THIS WILL BE OFFERED BY OUR CLIENTS.

TELEPHONE OR WRITE TO US NOW SO THAT WE CAN ARRANGE FOR YOU TO ATTEND AN EARLY INTERVIEW – EITHER IN LONDON OR THE SOUTH.

INBUCON MANAGEMENT CONSULTANTS LIMITED
D.P. Appointments & Contract Personnel,
Greenock House, 19 Cuckfield Road, Hurstpierpoint,
Sussex BN6 9RP. Telephone: Hurstpierpoint (0273) 833848.

15272

INBUCON



BP Exploration

BP is Britain's largest and one of the world's most successful companies.

International expansion and diversification both in energy-related and other activities has led to the creation of a new corporate structure.

New companies have been formed to pursue our international interests in Exploration, Oil (refining and marketing), Chemicals, Minerals, Coal, Gas, Nutrition, Detergents and other new ventures.

BP Exploration, the company concerned with oil and gas exploration and development, is responsible for one of the most extensive and effective discovery programmes in the industry.

Applications Programmer

to work with Research Geophysicists on the implementation of user-friendly packages of scientific programs. We use a DEC VAX 11/780 under VMS and a wide range of peripheral equipment, including interactive graphics.

Candidates with a degree in applied mathematics, or similar, should have thorough knowledge of Fortran and at least 2 years' experience of applications software development on a Mainframe or IDI Computer System. An inclination towards system analysis and good program design will be given full expression, but flexibility of approach is the major requirement.

Salaries and benefits are attractive and include a non-contributory pension scheme, subsidised lunches and good sports and social facilities.

Please write, giving details of age, qualifications and experience, quoting ref: FY.975, to: Sue Bartholomew, Central Recruitment, The British Petroleum Company Ltd., Britannic House, Moor Lane, London EC2Y 9BU.

BP Britain at its best

Customer Engineers; Software Engineer

Saudi Arabia

Our distributor in the Kingdom of Saudi Arabia needs to recruit two Customer Engineers and a Software Engineer to cope with increasing demand for our HP 3000 range of computers.

The Customer Engineers should have several years' experience in maintaining and servicing similar equipment, and be able to build up good client relationships. Our service reputation is very high and we expect you to continue this enviable track record. Salaries for these positions range between £12,000-£18,000 p.a. depending on experience.

The Software Engineer's main responsibilities will be to support our commercial and technical computers, advise customers on the use of software sub-systems and provide technical support to the sales team. Ideally you should have working knowledge of our HP 3000 range or have experience on large commercial minis or mainframes. You should also have spent at least 3 years as an Analyst or Senior Programmer and be experienced in database and real-time applications. Knowledge of accounting, payroll, inventory or communication systems is also essential. Salary scale ranges from between £14,000-£20,000 depending on experience.

In addition to the salaries mentioned (payable in Saudi Riyals, with exchange rate protection), you will be offered free accommodation, free annual flight home and other benefits. Contracts will run for two years and are renewable.

Please send full career and personal details to: Maureen Rowley, Personnel Department, Hewlett-Packard Limited, King Street Lane, Winnersh, Wokingham, Berkshire, RG11 5AR. Alternatively ring her on Wokingham 784774 for an application form.

HEWLETT PACKARD

(5259)

Do you want to be part of a success story for the 1980's?

Excitement, Enthusiasm and **Expansion** are the key words to describe Computer Resources, one of today's fastest growing UK Computing Services Companies.

Established in the early 1970's, we have gained considerable experience in Systems Development, Hardware/Software Product Services and Total Computing Solutions allied to Bureau Services. Armed with this experience, we are able to combat the gloom and despondency which surrounds us to enjoy the success so rightly deserved by a professional committed company.

Computer Resources is also independent. Unlike many of our competitors, we can react quickly to meet market trends, fulfil expansion programmes and make contract decisions without time consuming consultations demanded by Parent Companies. This freedom is allowing Computer Resources to race to the top of the Computing Services league and we believe the 1980's will see us as the leading independent UK Computing Services Company.

Do we sound like your kind of company? If so, read on.

We are looking for data processing professionals who will be based at Computer Resources' data centre situated to the West of London. Previous experience in providing IBM Computing Services to a wide range of commercial and industrial clients is essential, as is an ability to build good personal client relations within a Computing Services environment.

Senior positions will demand strict appreciation of management control in a profit-making environment and will involve travel to Europe and the Middle East. Any language knowledge would be beneficial.

Positions include:

Data Centre Manager – Package to £15,000 pa
To plan, direct and co-ordinate the operation of Computer Resources expanding data processing services in the UK and overseas. Experienced management of significant commercial IBM installations providing clients with a high level of service is essential.

Operations Staff – Package to £10,000 pa
Senior Operations staff with proven experience in IBM operating systems – MVS, VM/CMS, DOS/VSE. In addition, client contact will be required to ensure the successful processing of data.

Technical Services Manager – Package to £20,000 pa
To take responsibility for all software installation and operation for Computer Resources' multi IBM mainframe configuration including a substantial teleprocessing environment. The successful applicant will also be responsible for the promotion of technical support services provided to clients on an increasing level.

Systems Programmers – Package to £15,000 pa
To work in-house and on-site to support clients' systems. Applicants must have proven experience in one or more Database systems, MVS/TSO, VM/CMS, DOS/VSE, VTAM/TCAM, STAIRS, ATMS, CICS and telecommunications.

Systems Analysts – Package to £15,000 pa
Senior staff with experience in the design, implementation, management and support of a wide-range of commercial on-line systems.

Applications Programmers – Package to £10,000 pa
All levels of personnel with sound experience to join a large team on a prestigious on-line project. COBOL on IBM hardware and ADABAS experience is particularly relevant.

Are you our kind of person? If so contact:
The Personnel Manager
Computer Resources Ltd
Walkden House
Melton Street
London NW1 2EB
Telephone: 01-388 2577

Computer Resources' Professional Services Division also has vacancies for experienced systems and programming staff in its London, Coventry, Birmingham, Leeds and Manchester Branches.
Applicants should contact the Personnel Manager.

COMPUTER RESOURCES

Sales Executive

c£14,000 + commission

Surrey/Hants border
Relocation package available

We have been retained by our Client, part of a privately owned British Group with a record of continuing profitable expansion, to recruit a successful Sales Executive who has the ability to progress into sales management within a short timescale. Established since 1969 they have earned a well-recognised reputation for excellence in specialised areas of data processing and communications.

As one of four subsidiary companies, our Client manufactures an integrated range of data processing and communication devices for the Services and for secure and harsh environments in Commerce and Industry. The turnover currently is circa £1m and is expected to increase this year.

Ideally the successful candidate will be aged 30/35, educated to HNC/Degree level, possess practical experience of communications equipment, and have at least two (preferably five) years of successful sales experience of closely related products. This experience might well have followed a number of years as a Serving Officer in H.M. Forces. The ability to develop customer requirements, negotiate at the highest level and work without supervision is essential.

A base salary circa £14,000 plus commission will be offered. A prestige company car, assisted pension scheme, and comprehensive medical schemes are some of the fringe benefits available. A generous relocation package is available, where required.

For further information and an immediate confidential interview, telephone Chris Fry on 01-935 0671 (24-hour answering service) or 01-637 8795 (evenings Monday-Thursday) or 021-742 1992 (weekends).

SCR
Specialist Computer Recruitment Ltd

London 01-935 0671 3 Mandeville Place, Wigmore Street, London W1M 5LB.
Birmingham 021-236 3781 35-37 Great Charles Street, Queensway, Birmingham B3 3JY.
Manchester 061-833 0427 Blackfriars House, The Parsonage, Manchester M3 2JA.
Brussels 010 322-640 7151/71 Avenue Louise 327, Boite 4, 1050 Bruxelles.
Amsterdam 010 3120-760847 Willemsparkweg 92, 1071 H.M. Amsterdam.

VAX 11/780 Systems Infomatics Applications

London location — **Salary circa £10K**

Pergamon-InfoLine are installing a VAX with 7 gigabyte of on-line storage (and that's just for starters).

We offer on-line access to big bibliographic databases; private database services; video disc systems and electronic publishing activities.

We need two key staff to join our small systems team

System Controller

To become our resident VAX genius; care about operating systems, tune the machine, manage the storage and generally make sure we offer the best on-line service in Europe.

DEC experience (VAX, wonderful), Science degree and 2-5 years' practical experience in a systems/operation environment.

Analyst Programmer

To develop new information facilities; design and load databases and support customers' applications.

2-5 years' experience of analysis and/or FORTRAN programming (preferably on DEC kit). Science degree. Experience of information retrieval/information handling a definite advantage.

All members of the team make a real contribution to the success of the company. We can offer you a high level of job satisfaction, a lot of hard work, real responsibility, an application area with fantastic growth, and not a moment of boredom.

For an informal talk about the opportunities ring Bob Browne or Patrick Gibbins on (01) 836 1876 or write for an application form to:

Pergamon-InfoLine
Brettenham House
Lancaster Place
London WC2E 7EN

هكذا عند الأصل

Coventry
the positive centre

An exceptional career move for Systems Programmers

- ★ Are you a systems programmer looking for a more responsible and rewarding role or a chief systems programmer looking for a move to an expanding installation using up-to-date software and hardware?
- ★ Could you lead a team of systems programmers supporting an ambitious Computing Services Unit running a 3031 under MVS?
- ★ Do you have 5 years or more experience of systems programming and a knowledge of current MVS software?
- ★ Can you demonstrate an ability to implement a major new software release, within target?

If this sounds like you then there's an exciting opportunity for you in Coventry, with a salary negotiable between £9,500 and £12,000.

As Chief Systems Programmer you'll enjoy an excellent range of benefits including job security, excellant holiday entitlements, and relocation expenses in appropriate cases.

For further details ring Terry Street on Coventry (0203) 25555, extension 2176 or Coventry 417574 after 6pm for an informal discussion.

Or write to:
Head of Computing Services, Coventry City Council, Council House, Coventry CV1 5RQ, for details and an application form.

(5218)

We'd like to present Aramco to you

Systems Programmers
Business Systems Analysts
EDP Trainers
Systems Analysts
Systems Designers
EDP Planners
Office Systems Analysts
Programmers
Standards Writers
Contracts Analysts
Systems Analysts
(with Hewlett-Packard experience)
Transport Data Systems Advisers

All candidates should have a minimum of three years' industry experience on large IBM systems hardware (except where otherwise stated). You should also have a degree/HI.D or similar qualification.

Benefits package includes
● Subsidised accommodation ● Free medical care ● Free transport ● Regular repatriation flights ● Excellent recreation facilities ● Prospects of married status for senior personnel

Salaries up to £22,500 after tax

If you cannot identify your job above but meet the basic requirements we'd still like to see you.

An Aramco representative and an OCC consultant will be at the following venues to discuss your prospects with the world's largest oil and NGL producing company. Apart from providing more information on job opportunities with Aramco we will be showing a slide presentation on the company and the Kingdom of Saudi Arabia. Come along and meet us at . . .

Bridbury Hall Hotel and Country Club
Off Osborne Road, Goyt Valley
Greater Manchester
Tuesday 28th April, 2pm–8.30pm

Strathallan Hotel
Hadley Road, Birmingham
Wednesday 29th April, 2pm–8.30pm

Grand Hotel
Broad Street, Bristol
Thursday 30th April, 2pm–8.30pm

Polygon Hotel
Cumberland Place, Southampton
Friday 1st May, 1pm–6pm

If you cannot make it to any location then call Mike Mead or write to him at the address below.

OCC Computer Personnel

Specialists since 1971 in UK and international computer and technical appointments.

16 Bedford Row
London WC1R 4EB
Tel: 01-242 9356
24 hour answer service

ANALYST/PROGRAMMER
for quality assurance

The Centre, one of the largest university computer centres in the country, has two large CDC mainframes which service several hundred terminals, graphic displays and minicomputers in the College and other institutions of the University of London. An Analyst/Programmer is required to assist in the maintenance, enhancement and control of the Centre's current software, the implementation of future software and evaluation of systems performance. Applicants should preferably be graduates with experience of computing in a high level language. Salary according to age, qualifications and experience within the ORS Grade 1B range £9252-£9892 p.a. including London Allowance.

Apply, with c.v., to the Director of Computing Services, Imperial College Computer Centre, Exhibition Road, SW7 2BX. (5261)

COMPUTER CAREERS IN AUSTRALIA

Opportunity!

If you have 3 years relevant current D.P. experience write for details and brochure to S.M.O., Agent General for Victoria, Victoria House, Strand, London WC2B 4LG.

Interviews will be held in London and Manchester during July 1981.

5220

FORTRAN PROGRAMMERS

Informal Interviews

30th April at THE CROMWELL, High Street, Stevenage. 5.30pm to 10pm

The Company:
Our client specialises in the design, worldwide marketing and support of high technology C.A.D. software systems at its headquarters in the U.K. From Stevenage, comes a new approach to technology transfer, coupled with an ambitious expansion plan.

Your Task:
To be involved with one of the many C.A.D. software projects bridging the gap between research and all forms of industry e.g. electronics, mechanical, industrial engineering, plant engineering and design. We require Programmers at all levels.

The Rewards:
These positions carry top salaries and bonus, negotiable according to age and experience. The package also includes a contributory pension scheme, non contributory permanent health insurance, sickness benefit and 4 weeks annual holiday

The People:
Come along, have a drink and a chat with our client. See the software packages available at the venue and meet the people involved. If you are unable to attend don't hesitate to telephone or write to Derek Carberry

Carlton PERSONNEL SERVICES
58 High Street, Biggleswade, Beds
Telephone 316622 day or Letchworth 3087 evenings and weekends.

SALES OPPORTUNITIES

MIDLANDS — **YORKSHIRE**

A member of a well-established and positively-managed group of companies, Cypher is currently planning a further expansion of its UK marketing operation. Successful professional sales people are therefore required for our offices in the Midlands and in West Yorkshire.

In conjunction with a major international hardware manufacturer, the Company supplies 'line-of-business' packages and custom-written software solutions to commercial customers. Applicants should therefore have a knowledge of commercial computer applications and should be able to demonstrate a sound record of achievement in a professional sales environment (hardware or software).

An excellent remuneration package (attractive basic salary + commission + company car) is available to the successful applicants.

Please write with full details of career to date to:

MARGARET FOSTER
CYPHER COMPUTERS LTD
BANK HOUSE
CARLIOL SQUARE
NEWCASTLE ON TYNE NE1 6UL
Tel: 0632 29654

(5260) CYPHER COMPUTERS LIMITED

CoOperators

CONTRACTS

SAUDI ARABIA, c. £15,000 NET. Operations Supervisors are urgently required for HEWLETT PACKARD 1000E installation, using RTE. Indefinite term contracts available for experienced staff. Call Keith or Liz on 01-836 8411.

DEC PDP 11/70 RSX 11M Technical Support, Home Counties.

Honeywell OS2000 Operator, London.

ICL DME G3 Shift Management, Midlands.

Call Laurence or Liz on 01-836 8411.

PERMANENT

We need the following OPERATORS NOW.

IBM OS/VS2 MVS JES2, N. Surrey, £6K, 12-hour shifts, 2 years' minimum experience, excellent benefits include relocation expenses. Ref: MC87CW.

66800, S.E. London, £6.5K+, 12-hour shifts, 1 year minimum experience, good prospects. Ref: MC35CW.

EXEC 8 (U 1100), S.W. London, c. £6.5K, days only, 2 years' minimum experience, very good prospects. Ref: MC131CW.

GCOS on H64/62, S.W. London, c. £6K, days only, 2 years' minimum experience, capable of working alone. Good benefits and prospects. Ref: MC128CW.

If you match any of the above 4 positions call Mary now on 01-836 8411.

PDP RST/S S/L Ops **Supervisor, N.W. London, £7-£8K.** Days only, progressive company — expanding T.P. Network. Ref: KS118.

GCOS H64 Operator, S.W. London, £7K. Newly-acquired hardware. 2 shifts. Ref: KS3.

IBM OS VS1 VM Operator, City, £6.2K, banking environment offering cheap MORTGAGE FACILITY. Ref: KS138.

GCOS H66 Senior Operator, Cambridge, £7,300+, 2-3 years' H66 experience preferably with JCL. Relocation costs paid — cheap housing area. Ref: KS137.

Would you like to hear more about any of the above 4 positions? Then phone Kay on 01-836 8411 (reverse charges).

IBM DOS Technical Support, £10.7K, Herts. Suitable candidates will have IBM experience in a systems support function. Ref: MM125CW.

Shift Control Leader, £9.2K, Middlesex. Minimum of 2½ years' operating experience under OS/VS or OS/MVS, plus a good working knowledge of JCL and IBM utilities. Ref: MM133CW.

Operations Support, £7.3K, Middlesex. Fully conversant with JCL and IBM utilities within an OS/VS1 environment. Ref: MM130CW.

Operations Supervisor, £6K, Middlesex. A good understanding of a Sales Ledger System and user liaison ability. Honeywell Level 6 experience or any small machine background. Ref: MM122CW.

Please call Madeleine Menzies on 01-836 8411 concerning any of the above 4 positions.

CoOperators
68/69 St Martins Lane
London WC2N 4JS
Telephone 836 8411

01-836 8411

هكذا منه الأجل

★ U.S.A. ★
NEW YORK

PROGRAMMER ANALYSTS
Mini/Micro exp. (ideally DEC)
ONLINE ASSEMBLER

TECHNICAL SUPPORT PROGRAMMER ANALYSTS
IBM ASSEMBLER/COBOL with IMS plus Database maintenance exp.

PROGRAMMER ANALYSTS (TP Support Group)
IBM ASSEMBLER/COBOL
OS VSAM & CICS

PROGRAMMER ANALYSTS
PDP ARBAT or FOREX exp.

Interviews for these positions will commence in LONDON on MAY 11, 1981. If interested send your c.v. or call LLOYD WILLIAMS at Computer Two Thousand. Financial assistance will be given to successful candidates for visa petitioning and relocation.

N.B. We now have clients in many different locations in the U.S.A. (including the West Coast and Florida) and would always be pleased to hear from Programmers and Analysts with a minimum 3 years' experience on IBM mainframes.

COMPUTER TWO THOUSAND LTD
D.P. Recruitment Consultants
217-218 Tottenham Court Road
London W1P 9AF
Tel: 01-636 7584 (24 hrs) (5277)

HAWKER SIDDELEY
Mirrlees Blackstone (Stamford) Limited

Cobol Programmer with Analytical Connections

Mirrlees Blackstone are a successful member of the Hawker Siddeley Group and are among the UK leaders in the design and manufacture of industrial and marine diesel engines. Our DP department is working towards total on-line computer control of all areas of the company's manufacturing systems and now needs an experienced Programmer/Analyst to assist in this development.

We run an ICL 2946 mainframe with 224K words of core and an expanding 7500 VDU terminal system. TOTAL database and CINCOM on-line manufacturing control packages are currently being introduced and magnetic tape is being added to our existing disc system. Financial accounting and planning systems are already on-line.

This is an outstanding opportunity for a man or woman with at least two year's COBOL programming experience to join a small, established DP unit at an exciting and critical stage of its development. On-line experience in a manufacturing environment using discs and tapes is preferred and some exposure to systems analysis is essential.

Our factory is situated in Stamford, Lincolnshire — a historic old town of genuine character which remains unspoilt and offers reasonably priced accommodation. Working conditions are good — and include first class canteen and sports and social facilities.

The position carries a highly competitive salary together with a range of benefits — including free life assurance, generous assistance with relocation expenses and good prospects.

For an application form write or 'phone R.C. Williams, Personnel Manager, Mirrlees Blackstone (Stamford) Limited, PO Box 2, STAMFORD, Lincolnshire. Telephone Stamford (0780) 4641.

A Member of the Hawker Siddeley Group
(5223)

ROCHFORD
COMPUTING CENTRE

Development Staff

Deputy Computer Manager
Systems Analyst/Programmer — **Salaries to £11,000**

Rochford D.C. are setting up a new Computer Unit based on an ICL.ME29 with tapes, discs and terminals, and are committed to substantial future expansion.

The authority needs a small team to set up this installation and to form the nucleus of an expanding D.P. Department.

For further information contact:

A. O. STANTON, COMPUTER MANAGER
COUNCIL OFFICES, SOUTH STREET
ROCHFORD, ESSEX SS4 1BW
Tel. Southend-on-Sea 546366

(5224)

Cambridge Instruments Limited, innovators and world leaders in Scanning Electron Beam Instrumentation and Image Analysing Computers are extending the Electronic Development Team. Therefore the following positions are available:

PRINCIPAL PROGRAMMER/ANALYST

A minimum of three years' experience on DEC systems, preferably PDP 11 and have used either RSX 11 or RT 11 coupled with Macro Assembler Programming.

PROGRAMMER/ANALYST

A BSc degree or equivalent qualifications are required. Previous experience with Fortran or Pascal on Real Time [illegible] Programming.

The ideal [illegible] for these positions should be educated to degree standard with Honours in Electronics, [illegible] or Computer Science. The positions offer [illegible] in Development from initial conception [illegible] and market introduction. [illegible] benefits and salaries are offered by a [illegible] high technology Company which is a major force in a worldwide growth industry. [illegible] relocation is also [illegible] to the [illegible].

Applicants who are able to fulfil the above requirements should either write or telephone for an application form to John [illegible] — Personnel Department.

CAMBRIDGE INSTRUMENTS LIMITED
Rustat Road, Cambridge CB1 3QH
Tel: (0223) [illegible]

The POLYTECHNIC
WOLVERHAMPTON

POLYTECHNIC COMPUTER CENTRE

The Computer Centre provides a service to a wide range of students, academic and administrative staff, providing scientific, non-numeric, commercial and systems support. A large dual Prime 500 interactive system supports upwards of 70 terminals. There is a vacancy for a post of

PROGRAMMER

(AP3/4/5 £5,286-£7,338)

Candidates should have a formal qualification, preferably to degree level with practical programming experience. Closing date — 1st May, 1981.

Further details from: "Personnel," THE POLYTECHNIC, WOLVERHAMPTON WV1 1SB. Tel. (0902) 710654 (24-hr. ansaphone). (5226)

COMPUTER AUDITOR

£9,387-£11,282 p.a. inc.
(subject to review w.e.f. 1st April 1981)

This post carries responsibility within the Regional Audit team for auditing the systems and operations of a Regional Computer Centre which serves all Health Authorities in the South East Thames Region, as well as London postgraduate hospitals.

The Authority employs an ICL 1904S mainframe supported by a twin ICL 2904 installation. In addition, there are mini-computers for local and remote data capture and on-line interrogation facilities are to be developed.

Applications are sought from computer professionals who ideally are experienced in the audit of financial systems but, if necessary, training in this respect will be given.

An interesting feature of the post is the engagement by the Regional Health Authority of professional consultants whose services will be available to assist the appointee. There are good future career prospects either in the computer or finance fields.

Write for further information and an application form to the Personnel Officer, SETRHA, Randolph House, 46/48 Wellesley Road, Croydon, CR9 3QA, or telephone 01-686 8877 Ext. 55 quoting ref 134. Closing date for applications 8th May. (5245)

A CHANGE OF CAREER EMPHASIS?

SENIOR PROGRAMMERS — CENTRAL LONDON — £12,000+

Currently, you will be a **senior programmer** that has the usual team reporting to you. You will want to move on, but are not sure of the direction — well, how about using what you know to become part of a **management team?**

Our clients, part of a large international hotel and leisure group, are looking for a senior **IBM COBOL** programmer to lead their applications programming team.

The company operates a 3 megabyte **IBM 4331 GROUP 2** under VM/CMS and is developing **INTERACTIVE** and **ENQUIRY SYSTEMS** via terminals. The successful applicant will be responsible for the running of the applications group of four and will advise on the development of the team for these major new systems with particular emphasis on accounting.

A degree or equivalent professional qualification is preferred and the position carries the title of **CHIEF PROGRAMMER.**

As well as an excellent salary, the benefits include:

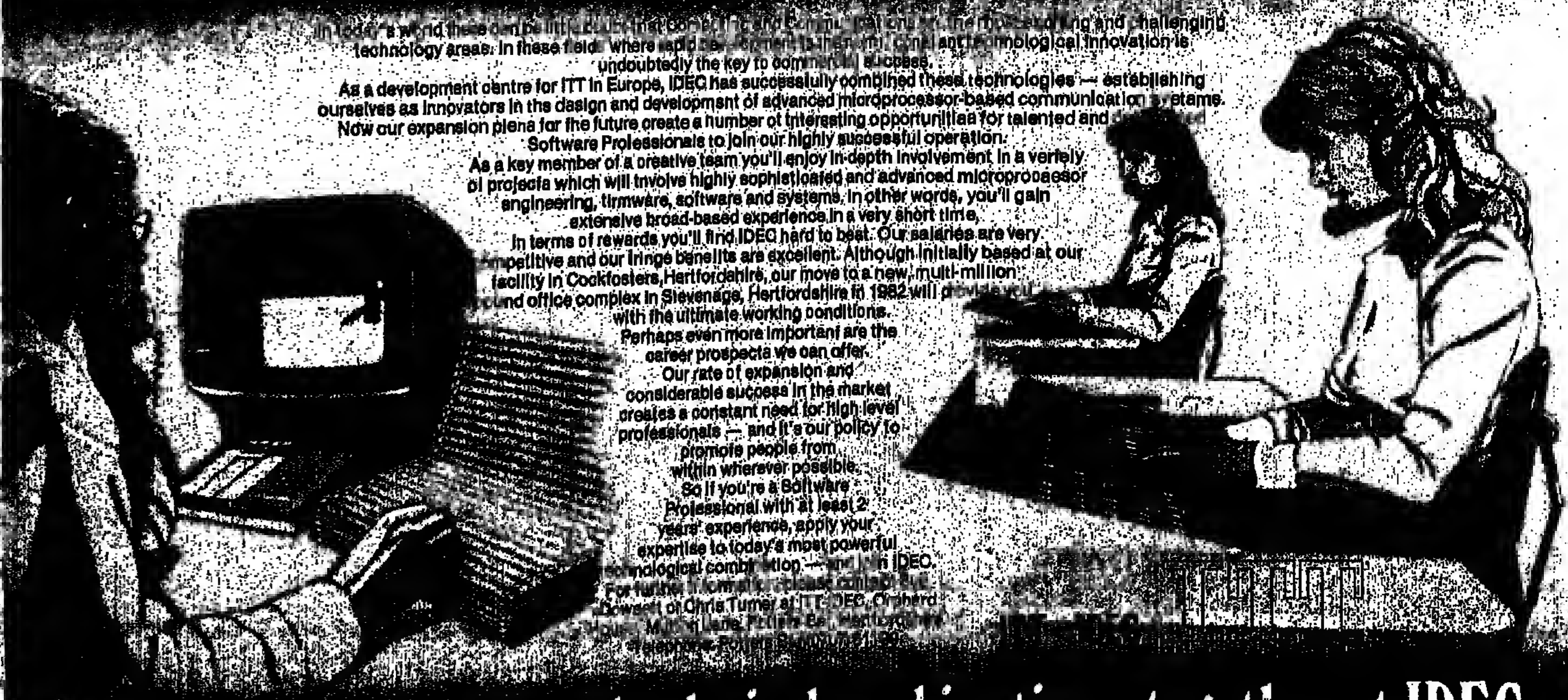
- ★ **Generous travel subsidy**
- ★ **Group discount scheme**
- ★ **Flex-time**
- ★ **Group pension scheme**

Interested? Then contact (0892) 35712

COMPUTANT LIMITED
RECRUITMENT AGENCY
14 MOUNT PLEASANT TUNBRIDGE WELLS KENT
TELEPHONE: TUNBRIDGE WELLS 35712-3-4
(5218)

SOFTWARE PROFESSIONALS

Computing & Communications



In today's world there can be little doubt that computing and communications are the most exciting and challenging technology areas. In these fields, where rapid [illegible] technological innovation is undoubtedly the key to commercial success.

As a development centre for ITT in Europe, IDEC has successfully combined these technologies — establishing ourselves as innovators in the design and development of advanced microprocessor-based communication systems. Now our expansion plans for the future create a number of interesting opportunities for talented and [illegible] Software Professionals to join our highly successful operation.

As a key member of a creative team you'll enjoy in-depth involvement in a variety of projects which will involve highly sophisticated and advanced microprocessor engineering, firmware, software and systems. In other words, you'll gain extensive broad-based experience in a very short time.

In terms of rewards you'll find IDEC hard to beat. Our salaries are very competitive and our fringe benefits are excellent. Although initially based at our facility in Cockfosters, Hertfordshire, our move to a new, multi-million pound office complex in Stevenage, Hertfordshire in 1982 will provide you with the ultimate working conditions.

Perhaps even more important are the career prospects we can offer. Our rate of expansion and considerable success in the market creates a constant need for high level professionals — and it's our policy to promote people from within wherever possible.

So if you're a Software Professional with at least 2 years' experience, apply your expertise to today's most powerful technological combination — and join IDEC.

For further information [illegible] Dowsett or Chris Turner at ITT IDEC, Orchard [illegible] Lane [illegible]

Today's most powerful technological combination...together at IDEC

SYSTEMS DESIGNERS

Micro Systems Designers wanted for Dutch Automation Company, good Assembler knowledge plus one or more of Pascal, Fortran, PL/II, Coral 66, RTL/2. Data transmission/data collection experience advantageous.

to £14K + Car

COBOL GERMANY

Programmers and Analysts required for ANSI CDBDL development work (3+ yrs. exp.), our client is a West German Systems House in Cologne providing software and consultancy in commercial and technical fields.

£12-15K neg

MICROS MINIS

Hardware and Software Specialists urgently required by Dutch Systems and Software House, 3+ years commercial or technical S/W or 5+ years hardware experience on DEC, HP, Olivetti or small IBM/ICL equipment.

£11-16K

DB/DC HOLLAND

Programmers, Analysts and Designers with either CICS, IMS, DL/1 or TPS, TDS, DMIV database/data comms experience, preferably with knowledge of COBOL, PL/1 or RPG required by Software House. Minimum 3 years' experience required, work is mainly on management and commercial systems.

to £16K

CONSULTANTS

Project Managers (aged 26-36) wishing to progress into a consultancy role required by Financial Systems House for their London and Manchester offices. Experience of implementing commercial systems (pref. DEC, DG, HP or similar) essential, plus professional and presentable image.

c£15K

HOLLAND IBM

COBOL Programmers (banking exp. preferred) and Financial Analysts with considerable IBM experience required to work on 3032 & 3033 (under MVS) at the Computing Centre of a leading Dutch Bank.

£10-16K + benefits

DEC AMSTERDAM

Software Engineers and Team Leaders with MACRO 11, PASCAL, COBOL on PDP 11s sought for development work at the head office of a diverse Systems and Software House. Degree level education preferred.

£12-16.5K

SYSTEMS PROGRAMMER

IBM Systems Programmer: 12 months' experience in Assembler preferred although programming candidates with PL/1 would be offered training. Location is at our clients IBM 4341 (OS) installation in North London.

£ neg

CAD/CAM BERKS & CAMBS

Opportunities exist for CAD/CAM experienced Software Engineers and Designers with two established leaders in this field: candidates should offer Fortran, preferably with some Assembler, on DEC, Prime or similar equipment. Some overseas travel may be called for.

£7-10K

MICROS-KENT

Micro Specialists in measurement, control and automation systems needed to provide additional expertise at our Client's advanced technology centre in North Kent. Elec. Eng. or similar background advantageous, plus minimum 5 years' solid micro experience. Relocation offered where applicable.

to £11K

(4952)

MATRIX

10 Grenville Place
London SW7 4RW
01-373 3063
to 8.30pm 7 days a week

D.O.E. Lic. No. SE(A)4127

Network and Operations Project Manager

c.£11,000

Our client, a major manufacturer of telecommunication equipment, is looking for a senior and experienced man or woman for a challenging and demanding position with extremely broad scope.

Reporting to the Group EDP Network and Operations Manager, you would be responsible for taking a total overview of the existing 15-year-old DP operation and recommending the changes necessary to bring it completely up to date. This would involve dealing with 6 locations, over 60 batch systems, a comprehensive on-line network and liaising with approximately 30 staff.

The areas where you would be expected to modify systems, procedures or standards, or introduce new ones, include Computer Operations, Scheduling Section, Data Preparation and Operational Support.

You should have at least seven years' top-flight DP experience, preferably in an IBM/VM/DOS installation. Above all, you should have well-proven creative abilities and the personal and communicative skills to deal effectively with a broad spectrum of people. You will also deputise for the Network and Operations Manager in his absence.

This is an excellent opportunity for the right person, and the salary and benefits package acknowledge this. In addition relocation expenses will be paid where appropriate.

Please write, naming companies to whom you do not wish to apply, to: Tony Goudge, Universal McCann Limited, 2-4 Fitzroy Street, London W1A 1AT.

(5229)

UNIVERSAL McCANN

هكذا عند الأصل

Database Analysts On-Line Network-Distributed Database

Greenford, Middx. c.£10,000 (inc.)

We are responsible for the UK manufacture of Glaxo pharmaceuticals and their sale in this Country.

Within our Management Services function we are now implementing a large network of Hewlett Packard HP 3000 mini-computers based around a central ICL mainframe, linking Head Office and five of our factory sites. A major development programme of advanced on-line systems being built around a distributed database necessitates recruitment of two Database Analysts to strengthen the team.

Reporting to the Database Administrator you would be responsible for contributing to the design, structuring and restructuring of database. An important part of your brief will be the security and integrity of all data and systems throughout our multisite distributed database structure.

You should have several years' experience in either systems development or operations. Knowledge of HP 3000 would be an advantage. Full training in database techniques will be provided if necessary.

Attractive conditions of employment include profit sharing scheme, non-contributory pension scheme, a subsidised cafeteria and excellent sports and social facilities.

Please write or telephone for an application form to: Miss V. A. Waters, Senior Personnel Officer, Glaxo Operations UK Ltd., Greenford Road, Greenford, Middlesex, or call 01-422 3434, ext. 340 quoting ref. FY/178.

GO GLAXO OPERATIONS

COMPUTER SERVICES MANAGER

c. £11,000 p.a. (negotiable)

Reporting to the Financial Controller, this newly-created position provides a unique opportunity to influence the development of computerisation in this world-renowned Hotel.

Our equipment consists of 2 Philips P7000 Mini Computers with 22 VDUs linked through a P851 to the EBX 8000 Telephone Exchange. It is envisaged that a Point-of-Sale system will be added to this unique configuration in the near future.

The successful applicant will possess a detailed knowledge of accounting and financial systems, gained either by experience or formal training.

Your previous experience should include systems analysis and involvement in the design of computerised accounting systems from basic principles, or at least 12 months' experience in a Computer Audit Department. You should also have the ability to communicate effectively to all levels of non-technical management and staff in the hotel.

The remuneration package will include Contributory Pension Scheme, private Medical Scheme and free meals on duty, in addition to the basic salary, which will be negotiable around £11,000 p.a.

If we are offering the kind of challenge that interests you, please telephone or write for an application form and further details to:

Sandra Burrows, Personnel, Training and Development Manager, at

The Dorchester
Park Lane, London, W1A 2HJ
(01-629 8888)

(5235)

CALMA

CALMA Company is a U.S.-based supplier of advanced Computer Systems for Interactive Graphic Design Applications.

Calma's products are extensively used in the Microelectronics industry for Integrated Circuit and printed Circuit Board design, in Cartography, and in a broad spectrum of 3D Mechanical and processed plant industries for CAD/CAM Applications.

We are currently enjoying a rapid expansion due to the success of our products and have opportunities for the following applicants.

1. HARDWARE TECHNICAL SUPPORT ENGINEER

Applicants should have a minimum of five years' Field Service experience on sophisticated digital computer systems. Familiarity with Interactive Graphic Systems would be advantageous, though not essential as appropriate training will be provided. The successful candidate will be a highly competent Engineer, capable of working on own initiative and who enjoys a challenge, and must also be prepared to travel to our Customers in Western Europe.

Salary circa £10,000 plus car.

2. TECHNICAL SUPPORT ENGINEERS FOR U.S.A.

The Company is also seeking Technical Support Engineers who would like to re-locate and work in the U.S.A. These candidates must be highly experienced, competent Engineers.

Salary negotiable.

3. HARDWARE TRAINING INSTRUCTOR

We require an Instructor to join our newly-formed European Training Centre. This is an exciting opportunity to assist with the building of a new Department. You should have considerable experience in Computer education and a thorough understanding of Electronics, coupled with the ability to teach at all levels including circuit component level. Experience of plotting equipment would be particularly relevant.

Salary circa £9,000.

4. REPAIR CENTRE ENGINEERS

We are seeking an Engineer to join our Repair Centre based at Head Office. Ideally, the applicant will have a minimum of two years' experience of repairing computer equipment down to component level. A thorough understanding of digital Electronics is essential and experience of analogue equipment would also be an advantage.

Salary circa £7,500.

In the first instance, write to:
Alan Littlewood
European Technical Service Manager
CALMA INTERACTIVE GRAPHIC SYSTEMS
Neville House, 55 Eden Street
Kingston upon Thames, Surrey

Soilax

SWINDON £9,000

ANALYST/PROGRAMMER

We are the U.K. subsidiary of an International Group specialising in the manufacture and distribution of chemical products, and are growing fast. We have an IBM SYSTEM 34 Computer and are embarking on an exciting and challenging development plan covering a wide range of applications (e.g. Sales, Production, Inventory, Finance).

We are seeking to appoint an energetic and experienced data processing professional. The successful applicant will be responsible for all aspects from feasibility to implementation of individual projects within the plan and must be able to work with minimum supervision.

Ideally you should have: Three years' experience in data processing; IBM System 34 experience; knowledge of the MAAPICS System; Experience in RPG II programming; Experience in the design and implementation of systems.

Salary will be negotiated depending on experience. Please write, including a curriculum vitae, to:

Mr. G. Goold, DP Manager
Soilax Limited
David Murray John Building
Swindon, Wiltshire SN1 1NO, England
Telephone 0793 485151, Telex 449184

BOX NUMBERS

Box number replies should be addressed to:

Box Number........................

c/o Computer Weekly
Dorset House
Stamford Street
London SE1 9LU

TWO NEW OPPORTUNITIES FOR TECHNICAL SALES MANAGERS!

CIRCA £12,000 BASIC+CAR — MIDLANDS

Anyone who responds to the challenge of pioneering will be attracted by our NEW VENTURE in the commercial marketplace. We are a Major Systems Company able to provide a TOTAL SYSTEMS CAPABILITY unmatched by our rivals. Our commitment to expansion has created TWO NEW SALES MANAGEMENT OPPORTUNITIES in differing disciplines.

GENERAL COMPUTER SYSTEMS

We can provide a comprehensive capability that spans contract staffing, mainframe timesharing systems, turn-key mini computer applications and packages in both general and specialist spheres.

We need a commercially alive Sales Manager to exploit both general and vertical markets that will lend themselves to such systems.

Although we would prefer a technical systems background, we are far more attracted by genuine ambition and flair.

MICRO SYSTEMS

This position offers unlimited scope to a true entrepreneur capable of capitalising on a business opportunity. Our product, a User driven micro computer is unique to the U.K. and has immense potential in both internal and external markets.

Our need is for a sales professional with the skills to explore and isolate natural markets for the product and assume total responsibility for the meeting of revenue targets together with setting margins and quotas to achieve profitability.

Both positions require the flexibility associated with a start-up situation particularly with regard to location, job definition and product market. This however will be more than compensated by the opportunity to hand-pick ones own sales team in the near future.

For a qualifying discussion on these new opportunities initial contact should be with Alan Carnell on 021-236 3781 (24 hour answering service) or 021-784 6063 (evenings and weekends).

All applications will be treated in confidence.

SCR

London 01-836 0871 3 Mandeville Place, Wigmore Street, London W1M 5LB.
Birmingham 021-236 3781 35-37 Great Charles Street, Queensway, Birmingham B3 3JY.
Manchester 061-833 0427 Blackfriars House, The Parsonage, Manchester M3 2JA.
Brussels 010 322-640 7151/71 Avenue Louise 327, Boite 4, 1050 Bruxelles.
Amsterdam 010 3120-760847 Willemsparkweg 92, 1071 H.M. Amsterdam.

(5264) Computing Services Association

Specialist Computer Recruitment Ltd

ASSISTANT DP MANAGER

HOME COUNTIES TO £13,000 PER ANNUM

If you are a Senior Programmer, Project Leader or Systems Analyst and wish to take the next step to Senior Management, and have a COBOL/PL1 background, then telephone to hear about this and other Senior DP vacancies.

(5283)

Sloangate The Appointments Register

TELEPHONE: 01-549 9236

SYSTEMS ANALYST

IF YOU
– are a potential software manager.
– are a small company man capable of doubling your salary.
– want to work with Pascal on Apple II.

Then apply to:
N. Unitt, 0989 4321
Metherton, Ross-on-Wye
Herefordshire

FARMPLAN

(5164)

SUFFOLK COLLEGE of Higher and Further Education
DEPARTMENT OF BUSINESS AND MANAGEMENT STUDIES

LECTURER GRADE 2

In Computer Studies

Requiring a good knowledge of Cobol and experience in Data Processing.

Salary Scale £6,462 to £10,431.

Further details and application form available from the Principal, Rope Walk, Ipswich, IP4 1LT to whom completed forms should be returned by 2nd May, 1981. Please quote post number 4.18, and enclose stamped addressed envelope.

(5231)

---

system operator services

The specialist Agency for all grades of Computer Staff

PROGRAMMERS
ANALYSTS
PROJECT LEADERS
OPERATORS AND D.P. STAFF

Vacancies all areas £6-13K
Ring 01-353 5646
or write to:
4 Ludgate Circus, London, E.C.4

(5246)

COMPUTER SERVICE ENGINEERS

£8K + Car + O/T + S.B.

Leading high growth minicomputer manufacturer requires Field Engineers in the Thames Valley area, W. Surrey and all areas London.

Excellent training provided with good career progression. If you have mainframe/mini/peripheral experience and need a change for the better, ring NOW for a brief chat.

DEE EXEC (AGY.) 01-549 9251

D.P. European Style

to £16,000 + tax advantages

Centre of the EEC, Brussels is among the most cosmopolitan of Continental cities, a pleasant mix of the very old with the very modern, with a distinctly European *Ambience*.

If you're considering taking an assignment overseas there could be few places more convenient to home, or which can offer a style of life on a par with this historic capital.

The following openings are immediately available with major clients:

ANALYST PROGRAMMERS

Experience in a commercial environment on Honeywell L6 and/or L66 with COBOL is essential. Practical knowledge of DMIV, database techniques, IDS, TPS an advantage.

REF: DG241

SOFTWARE SUPPORT PROGRAMMERS

Technical support, assisting in the development of on-line systems in a dual 370/158 under OS/MVS, CICS. Experience in a similar environment essential.

REF: DG242

ANALYST PROGRAMMERS

Two years' minimum experience on IBM S.34 and/or S.38 with RPG II together with analytical experience in a commercial environment.

REF: DG243

These are permanent appointments with multi-national companies offering tax relief on 30% of taxable income, relocation assistance, and other valuable benefits. There will be some opportunity for travel within Europe.

For further details please phone BERNARD TAYLOR on 01-580 ..., or write to him at: Fraser Williams (London) Ltd, 30 Warren St, London W1P 5PD.

Please quote appropriate reference.

Fraser Williams
Recruitment & Training

HEXAGON PERMANENT DIVISION

RECRUITMENT CONSULTANCY ... FACILITIES MANAGEMENT ... SYSTEMS, SOFTWARE PACKAGES

SENIOR PROGRAMMERS & PROGRAMMER ANALYSTS

London & Home Counties — Name Your Figure

★ To become involved in "State of the Art" Development using fully conversational IMS DB/DC
★ 2 years plus experience in COBOL with some CICS/DLI or IMS.

Ref: PJ81294

CHIEF PROGRAMMER

Central London — to £12K

★ 6/7 years COBOL Programming – UNIVAC exp preferred
★ To take part in Database applications
★ High degree of responsibility
★ Excellent benefits as expected of major company

Ref: PJ81270

CONSULTANTS, ANALYST PROGRAMMERS & PROGRAMMERS HP3000

Middx, Herts, City & Beds — Max £13K + Car

★ Developing Systems using HP3000/IMAGE/VIEW/QUERY
★ Requirements for BASIC & COBOL
★ Two requirements for SPL (will consider ICL PLAN)

Ref: PJ 81264

INSURANCE PROJECT LEADER

to £13K + Perks

★ Development of RT Insurance System
★ IBM CICS/DL1 Based

Ref: PJ81295

REAL TIME SYSTEMS PROFESSIONALS

London, Berks, Sussex, Hants & USA — ££s Unlimited

★ To develop Communication Systems
★ Preferably experience of PDPs or Micros, Teletex, Viewdata
★ Excellent Companies, Perks and Prospects
★ PASCAL, UNIX, C is a plus

Ref: PJ 80206

PROGRAMMER, SENIOR PROGRAMMER, ANALYST, PROJECT LEADER

Salaries to circa £13K negotiable

★ Team of 6 people
★ To design and implement Systems based on CICS/DL1 and DPPX
★ New 4300/8100 Combination

Ref: PJ81278

SYSTEMS PROGRAMMERS

London, Essex, Herts, Surrey — Totally Neg

★ DOS, OS, MVS
★ Junior, Medium & Heavyweight
★ 1 particular job to help support IBM related products, neg. and car

Ref: PJ81263

Open until at least 8.00 most evenings

(5252)

HEXAGON Computer Services

☎ 01-439 3671

If you've got the computing skills We've got the salaries

Top Salaries for Analysts up to £11,000 & Senior Analysts – up to £13,000

If you have a commercial background and have been involved with Systems Implementation, right through from start to finish, you'll find it pays to talk to Tesco – whatever you're earning right now. Pays not just in immediate rewards, but in genuine prospects of promotion to Project Leader and eventually to Senior Management.

Top Salaries for.– Programmers up to £9,300 & Senior Programmers – up to £11,300

Great chances, too, for COBOL Programmers with 12 months-plus IBM experience or at least 3 years experience including responsibility for other Programmers; Realistic salaries with, for those good enough, early opportunities for promotion to Programming Team Leader.

Top Salaries for Data Analysts – up to £14,000

Minimum of 2 years IMS DB/DC experience within a Database administrative function.

Top Salaries for Systems Programmers– up to £14,000

At least one year's Assembler programming experience and currently working as an IMS Systems Programmer.

Top Prospects for all

You'll be joining Tesco at the crest of a genuine revolution in retailing, brought about by a multi-million pound commitment to the very latest in IBM computer technology, not least the technically challenging EPOS (Electronic Point-of-Sale). So you can be assured of constant stimulus in your working day and every encouragement to share our success. Working with Tesco also brings more than the usual share of large company benefits and an ideal location at Cheshunt, Herts., that is pleasantly rural yet within easy reach of London. (Relocation expenses will, of course, be paid where appropriate.)

Or for further information, write to: Mrs Pat Bennett, Personnel Officer, Tesco Stores Ltd, Tesco House, Delamare Road, Cheshunt, Herts. EN8 9SL. Tel: Waltham Cross 32222.

IF YOU LIVE IN LIVERPOOL OR MANCHESTER Come and meet us at:
Atlantic Tower Hotel
Chapel Street
Liverpool Tel. 051-227 4444 Ext. 440
Tuesday 28th April
11am.–9.30pm.
or
Midland Hotel
Peter St., Manchester
Tel. 061-236 3333 Ext. 1111
Wednesday 29th April
12am.–9.30pm.

TESCO
MORE OPPORTUNITIES
to see your skills rewarded

(5222)

Regional Data Centre Managers

c.£14,500 + car
Cheltenham, Luton, Sheffield

Whitbread are one of Britain's top brewing groups, operating their breweries, distilleries and retail outlets through regional trading companies.

To provide a powerful new information retrieval, management and processing service for the entire organisation, a new Management Services facility is being established. This venture represents a £5½ million investment in a distributed network based on seven IBM 4341 mainframes, 400 VDU's and 60 printers.

Data Centres are being established in Cheltenham, Luton and Sheffield, each with equipment valued at £1.5 million and a staff of 20-25. Each of the managers sought will be responsible to the Group Operations Controller for the regional service provided.

Crucial tasks include the recruitment and development of staff, the development, planning and organisation of hardware changes, and the monitoring of user satisfaction through regular reviews and frequent visits to trading companies.

To match the job profile, you should preferably be educated to degree or equivalent level, with at least eight years' experience in Management Services – most of this in a discipline relating directly to the job – and able to demonstrate success as manager and motivator of a technical team. Confident administration of a critical work programme is essential.

Salaries negotiable in the region of £14,500 will be accompanied by a first-class benefits package which includes a company car and a generous relocation package where applicable. These positions are open to men and women.

For an application form, please phone or write to Pauline Pryor, Recruitment Administrator, Whitbread & Company Limited, Chiswell Street, London EC1Y 4SD. Telephone 01-606 4455. Please quote reference HQ/34.

(5228)

WHITBREAD

SYSTEMS ANALYSTS

WEST AFRICA

to £18,000 + House + Car + Substantial Benefits

Our client, a large and expanding international group, wishes to recruit two Systems Analysts for a large operation in West Africa employing some 9,000 people. The company is currently updating to an ICL 2904/60 using PLAN and COBOL with FORTRAN for technical operations. Reporting to the DP Manager the successful applicants will form part of a team designing and implementing systems for stock control, payroll, cost control and financial accounting.

In addition to salary benefits include married accommodation, 2½ months' leave after a year, free medical; education allowance, a provident fund and end of contract tax-free gratuity.

Applications are invited from those with MBCS or relevant degree aged 27-35 who preferably have worked overseas.

For further information please apply to E. G. Moors.

Reginald Welsh & Partners Limited.
Accountancy & Executive Recruitment Consultants
123/4 Newgate Street, London EC1A 7AA Tel: 01-600 8387

Computer Programmers

We have vacancies for experienced Programmers to assist in the further development of on-line systems in our finance and accounts branch. For this work we use an IBM 3033 with attached processor, which supports several hundred terminals using a variety of access methods.

We invite applications from candidates with a minimum qualification of two 'A' levels and a good working experience of COBOL. Knowledge of ASSEMBLER, TASKMASTER, VISAPL, FILETAB VSAM and familiarity with VDU use would be advantageous. Starting salary is normally £6245 pa rising by annual increments to a maximum of £7220 pa. (This is currently under review). Career prospects are good and the authority offer an attractive package of benefits, including an excellent contributory superannuation scheme.

Harwell is the largest single laboratory of the United Kingdom Atomic Energy Authority. It is pleasantly situated in the Oxfordshire Downs, within easy reach of Oxford, Abingdon, Newbury and Reading. Our own bus service operates from most local towns and villages. On site we have a restaurant, varied sports and social facilities and a small shopping centre. Hostel accommodation, or lodgings, can be provided for single recruits.

For further details and an application form, please phone Mrs. D. A. [illegible] Abingdon (0235) 24141, ext. [illegible] or send a postcard to Recruitment & Manpower Branch, Building 329, AERE Harwell, Didcot, Oxon OX11 0RA.

HARWELL

LOUGHBOROUGH UNIVERSITY OF TECHNOLOGY

PROGRAMMER/ANALYST

Applications are invited for the post of PROGRAMMER/ANALYST in the Data Processing Unit of the Administration, which uses the University's central ICL and Prime machines mainly in finance and personal records. Replacing the ICL in two years' time will involve developing new on-line systems to serve the administrative offices. COBOL is required; FILETAB would be an advantage.

Salary on scale £5285–£8975; it is hoped to appoint within the lower half of the scale. Further information and application form from Paul Johnson, Establishment Officer, ref. 81/17AD.

Loughborough Leicestershire (5218)

FOR **CLASSIFIED** ADVERTISING USE **DIRECT LINE 01-661 0121**

VIDECOM

Henley-on-Thames

ASSEMBLER/ PROGRAMMERS

Graduates with microprocessor programming experience (especially Z80), this is your opportunity to gain a high salary with excellent fringe benefits.

Videcom are manufacturers of the world's first multi-host computer terminal systems with an impressive installed base worldwide including international airlines and major corporations utilising its products in sophisticated communications networks.

Continuing expansion creates opportunities for experienced assembler programmers. Contact: Dr Andrew McLean at Videcom Ltd., Newtown Estate, Reading Road, Henley-on-Thames, Oxon RG9 1HG. Telephone: (04912) 78427. (5230)

INTERNATIONAL CONSULTANCY MANAGEMENT CAREER POSITION

As a consequence of continued expansion in our Domestic and International consulting activities, TANGENT COMPUTER SERVICES is actively seeking a Data Processing professional to fill a key position within the company.

TECHNICAL PERSONNEL AND RESOURCES MANAGER

A new division is to be created which will be responsible for all personnel activities – for both permanent and contracted technical staff. The ability to identify and select staff for assignments and projects is a prerequisite as is the ability to create and perform a full personnel function to all technical staff.

An in-depth and varied technical background, a pleasant personality and a professional attitude and approach to demanding situations are essential skills. A degree of foreign travel may be necessary particularly in connection with our New York subsidiary.

Working for, and in conjunction with the General Manager, the objectives are:

Initially – to take responsibility for centralising staff selection activities.

Medium term – to strengthen the department and concurrently revise the existing supportive computer aided "personnel management" systems.

Long term – to establish an able replacement and join the senior management of the company, for which a time scale of two years is projected.

This function is seen to be a key to the continued success and growth of the company and commensurate terms of employment are therefore offered.

Please reply in confidence to:
Alan King, General Manager
TANGENT COMPUTER SERVICES
102/106 South Street, Romford, Essex
Tel: Romford 750201

(5240)

CUSTOMER ENGINEERS – TRAIN U.S.A.

LONDON HOME COUNTIES (6 OFFICES)
£9K + O/T + S/B + 2 LTR CAR + BUPA

Our client manufactures an extensive range of high-performance systems including Real-Time Minis, distributed processing networks, small business systems and many others. Group sales exceed 1 Billion Dollars with over 20,000 installations world-wide. Growth and quality are hallmarks of this company offering exciting career opportunities to ambitious engineers seeking new challenge and advancement. If you have a computer/peripheral experience and want to progress your career in a really stimulating environment, call Keith Wallis now!

ALLTRONICS PEOPLE, 01-543 4844

The University of Birmingham

SYSTEMS ANALYST

Applications are invited for the post of Systems Analyst within the University's Administrative Data Processing Unit. The successful candidate will join a team of analysts responsible for developing on-line financial, payroll and student record systems on the Unit's ICL 2904/50 computer.

The post calls for a person of proven experience in the data processing field including at least 18 months in systems analysis. Previous experience with ICL equipment, while not essential, will be valuable; familiarity with financial and personal record systems and with current on-line techniques will be expected.

Salary on scale rising to £10,575, starting point according to qualifications and experience.

Further particulars and application forms, which should be returned by 18th May, 1981, are available from:

Senior Assistant Secretary, The University of Birmingham, P.O. Box 363, Birmingham B15 2TT. (6221)

JORDANHILL COLLEGE OF EDUCATION
76 SOUTHBRAE DRIVE
GLASGOW G13 1PP

COMPUTING OFFICER

The Computer Education Department, which was formed in 1971 and is currently expanding, has a vacancy for a person to be responsible for the management of the College Computer system, including scheduling, software support, supervision of operating staff and data control. There would also be an involvement with micro computing systems.

The successful candidate is likely to have either a combination of qualifications and experience or several years' relevant practical experience.

Salary scale is £8,139 to £10,464 per annum with placing according to qualifications and experience.

Further particulars and application forms should be obtained from the Personnel Officer at the above address to whom completed forms should be returned within 10 days of the appearance of this advertisement. (6251)

FALCONWOOD COMPUTER SERVICES

248 HIGH STREET, BROMLEY, KENT
OFFICE HOURS 01-460 9755
Evenings and Weekends 01-460 4038

Borough of Poole

SENIOR ANALYST/ PROGRAMMER

Salary grade AP5/SO1, £6,870-£8,139 per annum.

The Council will shortly be taking delivery of an ME29 computer which will operate as a RJE terminal to an ICL 2976 as well as a freestanding machine for certain [illegible]

Applications are invited for the above post which will [illegible] a major role in the transfer and future development [illegible] systems in the Authority. Applicants should have a [illegible] of experience in computing, preferably with [illegible] 2903/4 or similar and have an accounting [illegible]

The Council offers assistance towards the cost of [illegible] expenses, lodging allowance, legal and estate [illegible] fees, and a disturbance and travelling allowance [illegible] also paid. In certain cases, at the discretion of the Authority, the above allowances may also be applied to single officers.

Application forms available from the Chief Personnel Officer, 8 Commercial Road, Poole, Dorset (Tel: Poole [illegible]) ext 3464/5) returnable by 8 May 1981.

I K D Andrews,
Town Clerk and Chief Executive Officer (6262)

SENIOR PROGRAMMER

We are looking for a person to join a small team operating two Honeywell machines – a 62/60 and a DPS4, providing mainly on-line facilities for the operating divisions.

It is essential that applicants are fully conversant with communication as well as batch programming in order to be quickly involved in development of new systems and modifications to existing systems.

An attractive salary will be paid, depending on relevant experience, together with other usual company benefits.

Applications, including C.V. and present salary, should be addressed to:
Financial Director
W. J. FURSE & CO. LTD.
[illegible], Nottingham

(6180)

Furse
A Cohen House Company

Sailsmen

£25,000

It won't be plain sailing but the boom in business in this bouyant market will give you a chance to broaden your horizons and get on the crest of a wave. If you feel you won't be out of your depth and can keep on an even keel this is the course for you.

Our clients have, through their expertise in developing unique software packages, acquired an enviable proportion of a rapidly expanding world market.

This continuing expansion has necessitated the recruitment of two Sales Executives to take on challenging roles in the marketing of hardware and compatible software in the U.K.

If you have the following qualities, please contact JILL ATKINS for an early interview.

★ Hardware/Software Sales Experience
★ Tech. Background
★ Self-Motivation
★ Ambition

Computer Search
01-404 0152

Operations Support Officer

£8115-£8622

The person appointed will be involved in the following major areas of responsibility:

- Control of the telecommunications network.
- Application of resource control software.
- Preparation of Operations Group procedures and documentation.
- Programming and formatting the data entry systems (key-to-disc and 'Writeaway').
- Acceptance testing of new systems, software and hardware.

Applicants should have at least five years' experience in an Operations environment coupled with a good knowledge of UNIVAC OS1100 JCL and the ability to write clear and concise operating instructions. A basic knowledge of the telecommunications equipment associated with computer terminals and the programming of key-to-disc systems would be an advantage.

Operations Support Assistant

£6540-£7134

The Operations Support Assistant will be involved in the following main areas under the supervision of the Operations Support Officers:

- Maintenance of Operations Group procedures and documentation.
- Programming and formatting the data entry systems.
- Acceptance testing of new systems, software and hardware.
- Assisting with terminal network maintenance.
- Maintenance of resource control limits and documentation.
- Preparation of JCL for live applications and utility runs.

The post requires at least three years' operations experience. A knowledge of UNIVAC OS1100 JCL is desirable coupled with an ability to produce clear and concise written instructions.

Training will be given in both cases to bring the successful applicants up to the required standard.

Please write to the Head of Computer Services Division (Ref. KP), County Hall, Kingston upon Thames, Surrey, for an application form and copy of the job specification, or phone Phil Wilde on 01-546 1050, ext 3048 for further details.

SURREY COUNTY COUNCIL

(2278)

Applications Engineer

(General Systems Marketing)

A rapidly growing International Company, Zilog develops and manufactures microprocessors for a wide range of applications including development systems for computer designers and general purpose business and commercial macrocomputer systems.

As Applications Engineer you will report to the General Systems Marketing Manager and your responsibilities will include technical and marketing support to Zilog's European Sales organisation and to customers on the company's general systems products. You will provide training, technical seminars, application notes, competitive analyses, sales aids and other promotional material. Some European travel will also be required.

A car will be provided and you will be eligible to participate in non-contributory pension and BUPA medical plans.

Salary is negotiable

Please write in the first instance enclosing your curriculum vitae to:

Dr Helmut Geisler
Zilog (UK) Ltd.,
Babbage House, King St., Maidenhead, Berks SL6 1DU
Tel: (0628) 36131

Zilog
ZEXON

GUIDE TO RECRUITMENT CONSULTANTS IN THE U.K

LONDON & H. COUNTIES (LH). MIDLANDS (M). NORTH (N). SCOTLAND (S). OVERSEAS (O)

Computer Professional Recruitment Consultancy
"COMPUTER PROFESSIONALS — MAKE SURE WE HAVE YOU IN MIND"

Ivor Norton Management Services Ltd
Recruitment Consulting Division

COMPUTER INDUSTRY SPECIALISTS
SALES • SYSTEMS • MARKETING • ENGINEERING • PROGRAMMING
INSIGHT MARKETING & PERSONNEL CONSULTANTS LTD.

FOR THE BEST PERMANENT AND CONTRACT JOBS IN THE NORTH OF ENGLAND

A PROFESSIONAL RECRUITMENT SERVICE TO CLIENTS AND CANDIDATES

ANALYSTS & PROGRAMMERS

FOR FURTHER DETAILS OF THIS WEEKLY FEATURE CONTACT OWEN KELLY, 061-872 8861

Senior Technical Support Analyst

North Bucks **Up to £9,500**

Due to internal promotion, this is an excellent career opportunity for a Senior Technical Support Analyst to join a major company involved in high technology engineering.

Working in an expanding operations area principally running our IRBT on-line to remote IBM 370/168 and Amdahl V5, you will be required to support a variety of functions and your responsibilities will include:

- Assessing and advising on technical requirements of the Data Centre.
- Establish procedures and actions.
- Provide APL language support.
- System management for PDP11/34.

You will be required to have had a minimum of five years experience in Computer Operations and programming, within an IBM OS/MVS environment.

The Company offers in return a significant career development. The salary and benefits package is excellent and includes company pension scheme, free BUPA, four weeks holiday, generous relocation package and a subsidised staff restaurant.

Please write with full details or telephone for an application form to: Recruitment Executive, Position No. 463, Fleet Appointments, 34-38 Parker Street, Covent Garden, London WC2. Telephone 01-734 9028.

Fleet Appointments

(8243)

SMR
Sales & Marketing Recruiters Ltd

SALES EXECUTIVES

Just in case you think we are merely the industry's leading supplier of career guidance for salesmen (to say nothing of sales training and market research!), we are currently recruiting candidates for over 100 selling jobs within more than 30 computer companies.

If you are seeking a career rather than just a selling job, contact Alasdair Scott or Alan Williams — we have the experience to understand your needs.

Tel: 01-734 9776

(8004)

SALES PROFESSIONALS

VERY HIGH BASIC — 2-LITRE CAR
EXCELLENT COMMISSION (UNLIMITED)
OTHER BENEFITS
Good prospects for early promotion

Our client will be interested in talking with you if you have a successful selling record and a working knowledge of one or more of the following:

Commercial Applications
Distributive Processing Systems
Communications
OEM Sales
Key to Disc

In return you will be offered the opportunity to use your professional skills in an exciting environment with unlimited earning potential. In the first instance telephone Camberley (0276) 32898 (office hours) or Farnborough (0252) 516978 to 10 p.m.

CCAB

COMPUTER CONSUMER ADVICE BUREAU LTD.
Computer and Recruitment Consultants
5 Grsan Lane, Blackwater
Near Camberley, Surrey

(5110)

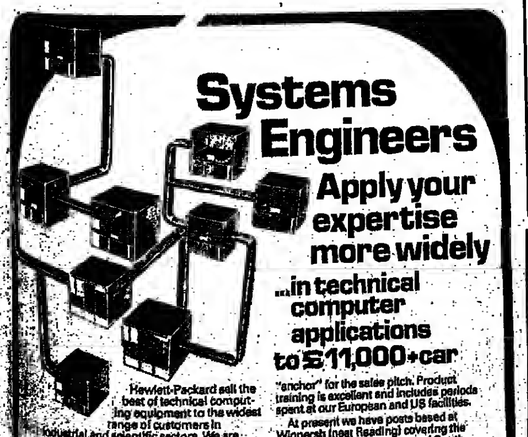
Business Machines TECHNICIANS

Saudi Arabia — c. £12,500

Technicians needed to install and service screen-based word processors, small business computers and other office machines for an installation and servicing company based in Riyadh. Bonuses on merit. Single status initially, M/S later.

C.Vs, quoting Ref: 38/SML/357, to F. J. Selleck Associates, 17 North Hill, Colchester CO1 1DZ. Telephone: 0206 66252

(5112)



Systems Engineers

Apply your expertise more widely

...in technical computer applications to £11,000+car

Hewlett-Packard sell the best of technical computing equipment to the widest range of customers in industrial and scientific sectors. We are successful in this market because we specialise in the head formation of integrated systems rather than standard solutions, and have structured ourselves to provide this vital flexibility.

The Systems Engineer in each of our field sales teams is the authority on the precise application each customer will need and on how Hewlett-Packard's hardware and software can best be configured to meet that need. It's a job with literally endless variety in the type, scope and scale of assignment. We need graduate calibre men or women whose breadth of aptitude to computer applications will equip them to define and solve problems over this spectrum; and whose knowledge of programming, hardware and software will provide a secure technical "anchor" for the sales pitch. Product training is excellent and includes periods spent at our European and US facilities.

At present we have posts based at Winnersh (near Reading) covering the Central South, South-West and South Wales; at South Queensferry (Edinburgh) covering Scotland and the Central belt; Aberdeen); and at London Colney (near St. Albans) covering London and the Home Counties. In all cases, mobility is essential. Starting salaries are to £11,000 plus 2-litre car, profit share, discounted BUPA, and relocation expenses where appropriate.

If the package, the engineering challenge and the commercial environment with strong customer contact appeal to you, write to or phone Annabel Bayly, Personnel Administrator, Hewlett-Packard Limited, King Street Lane, Winnersh, Wokingham, Berkshire RG11 5AR. Tel: Wokingham (0734) 784774.

HEWLETT PACKARD

SALES BIT

Women in selling — 1

Dissimilarity need not imply inequality

DURING the process of recruiting sales personnel I sometimes become involved in the often emotive topic of whether or not clients should employ saleswomen in what is very much a male dominated arena, particularly within the computer industry.

It is clearly difficult to keep away from either male or female chauvinism in such a discussion, so my role in these circumstances is to avoid the extremes of male intolerance and female paranoia and attempt to keep the conversation both objective and relative to the job and applicant in particular, as opposed to gender and selling in general.

I must admit to some prejudice on the topic myself, for my greatest intolerance is intolerance itself, and this can only result in sympathy for women on account of the way in which many attitudes are biased against them in terms of the roles for which it is assumed they are or are not suitable.

There is without doubt considerable prejudice against women in selling, particularly in Europe. It is a prejudice worse than blatant intolerance, for it seldom comes sufficiently to the surface of business activity to be grasped and displayed for what it really is.

The masculine attitude towards women in selling is generally fed on arrogance and insularity, and in many cases possibly reflects men's own domestic experience.

On the other hand, women themselves could do more to further their cause for real equality in all aspects of society by resisting the urge to over-react at the slightest hint of unfair treatment. Tolerance and decorum are the hallmark of the rightful cause.

It reminds me of a conversation I once had with a friend of mine who suffered considerably through being black, and living in a predominantly white neighbourhood.

This particular evening he was protesting bitterly about a situation where he had been treated differently from his white associates because of his colour. He was both hurt and angry and he said to those engaged in our conversation, "Why do they treat me differently, are we not all the same?"

There was a pause for thought, and then one of our group replied: "In all the ways that we understand and conceive to be important, we are equal, but we are not the same. You are black and I am white."

The point he was trying to make is that in any situation where fundamentally different people are seeking equality of opportunity, the worst possible thing they can do is to protest that the justification for equal treatment is that all the parties involved are the same when quite clearly they are not, in the absolute sense. To do so is merely to give one's protagonist the excuse that if the basis for the argument is wrong the claim must be equally invalid.

Like many aspects of life, one could view this matter as a sales situation. One is hardly likely to complete a sales negotiation in one's favour if the basis of one's argument is the absolute equality of one's product with that of the competition. Clearly, the only strategy is to identify the weaknesses of the opposition and one's own strengths, putting to one side the self-cancelling sameness, and exploiting the situation accordingly.

Men and women are not the same. If we can accept that as a reasonable statement of truth then we are half way towards equal opportunities and rights for women in all walks of life, rather than the second-class citizenship they are often exposed to.

Alan Williams

CONFERENCES

■ A SEMINAR called 'SSAP 16 — Current Cost Accounting in Practice' is being held throughout the year by Package Programs Ltd, PPL. Theory of CCA will be covered, along with practical problems arising in the application of SSAP 16 requirements. Intended for DP staff who work with financial systems and accounting staff responsible for the production of CCA accounts, it will be held at the Strand Palace Hotel, London, and costs £75 plus VAT. Details from Lorraine Buckley on 01-633 0121.

■ THE theme of this year's Education for the Future Conference is 'Careers in an Information Society'. Speakers at the conference will be: Kenneth Baker, Minister of Information Technology; Alistair Evans, deputy director, Institute of Personnel Management; John Anderson, deputy director, Microelectronics Education and Prof Tom Stonier from the School of Science and Society, Bradford University. The conference is organised by Bradford University and will be held there on July 7. Details from Mrs B. M. Pickard on Bradford 33466 ext 6193.

■ COMPUTING Strategy for Retailers is aimed at the DP manager and other executives with responsibility for financing and controlling DP investment. Organised by the Retail Management Development Programme, it will be held at the Cumberland Hotel in London on June 3-4. Speakers will include Barry Grange, director of Tesco, and Don Mildenhall of British Telecom. Further information from Neil James on (0273) 722687.

COMPUTER GRAPHICS

SYSTEMS ANALYST/ PROGRAMMER

Computer Graphics is a rapidly developing area within Television and this could be your chance to join us. You would be working on a wide variety of tasks ranging from investigation of Design and Production Departments software requirements to the design and implementation of applications code.

You should have some appreciation of graphic design and an interest in television output. Experience at high level and assembler languages on D.E.C. equipment and experience in computer graphics in TV systems, simulation or the printing industry would be an advantage.

Based: West London. Salary, which is currently under review, £7,802-£9,940 p.a. (starting salary according to qualifications and experience).

Contact us immediately for application form quoting reference G.2165/CW and enclose a s.a.e.: BBC Appointments, London, W1A 1AA. Tel: 01-580 4468, Ext. 4619.

BBC tv

(5241)

PUZZLE ANSWER

194215
130760
130760
130760
130760
130760+

8480.15